

The Commercial Car Journal

VOLUME XI

PHILADELPHIA, JULY 15, 1916

NUMBER 5

BRITAIN BARS AMERICAN TRUCKS

After July 16 the importation of trucks, chassis, parts and accessories, except tires, into the United Kingdom will be prohibited. Provision is made for the importation, under licenses issued by the Government, of such articles as may be approved by the authorities. Such goods will include fire apparatus, conveyances for the wounded or sick, for police and local government officials, agricultural purposes, or the conveyance of essential goods. Truck parts may be imported under licenses for cars already in the United Kingdom. There are now some 30 lines of American trucks represented in England. As the demand for trucks is greater than ever before, and as the home-made product is still largely taken up by the Government, British business men are to be forced by the Government to put up with inferior equipment or no equipment at all, lest perhaps American trucks secure too firm a foothold in the British market. France is practically doing the same thing, and has put a ban on all machines not ordered before May 8th. An attempt is being made to exempt commercial cars from this drastic measure, but the French effort is not apt to prove effective, since the Government is willing to rent trucks to government contractors as they may be required. Since the Government is purchasing the trucks from America, it will be able to provide all the vehicles that will be needed, thus giving the Government complete control of the situation so that a number of American enterprises will be prevented from securing a place in the French market.

TRUCK AND ACCESSORY MAKERS TO COMPENSATE MILITIAMEN

Every day brings new concerns into the ranks of those who are compensating such employees who have joined the army for work along the Mexican border.

Most of the large tire companies in Akron have made announcements of compensation, and open position for all employees who are enrolled in the State militia or who enlist for Mexican service.

The Firestone Co. will give all employees, who have been with the company for 3 years, who have enlisted prior to June 20, full pay, less the government allowance. Employees of 1 to 3 years, two-thirds pay, less the government allowance. The arrangements will hold good for one year and will also apply to all employees who enlist hereafter, down to six months' service with the company.

The Goodrich Co. will give all soldier employees, who are married or single and supporting dependents, two-thirds of their average pay, based on their earnings

Table of Contents

	Page
Advertisers' Index.....	151
Another Phase of Preparedness—By Russell Huff.....	8
Armleder Model H-W.....	31
Day-Elder Worm-Drive Commercial Cars.....	27
Denby Commercial Cars.....	32
Editorials.....	9
Experience of a Providence Department Store With Commercial Cars—By C. P. Shattuck.....	22
International Model H.....	25
Larrabee-Deyo Trucks in Two Sizes.....	30
Motor Truck Design and Construction Made Plain—By C. T. Schaefer.....	32c
N. A. C. C. Approves Service and Repair Parts Policies.....	6
New Commercial Cars.....	25
New Incorporations and Trade Changes.....	5
Personal Items.....	5
Pullman Announces a Light Delivery Car.....	26
Steps Taken to Enlarge Scope of Society of Automobile Engineers.....	15
Sterling Road Oiler in Service of the City of Milwaukee.....	21
The Motor Truck—Paper by H. B. Wittemore.....	32g
Used-Car Articles 11, 13, 14, 17, 32h, 34, 38	
Velie Biltwel Trucks.....	29

MANY BIDS SUBMITTED FOR WAR TRUCKS

As was expected, many bids were submitted to the Government in compliance with a request made for 2000 motor trucks and 400 cars of pleasure type for the officers' needs. Orders for the equipment are to be awarded shortly. The trucks are to be of 1½ ton and 3 ton capacity, specifications having been drawn up by a special committee after consulting with a committee appointed by the S. A. E. Calculating the average price of the trucks at \$2000 and the touring cars at \$900, the value of this one order would be \$4,360,000.

GASOLINE ELEVEN CENTS BY RITTMAN PROCESS

Gasoline may be produced for about 11 cents per gallon by the Rittman process when fuel oil sells for about \$1.40 per barrel, the average current price. This oil is the residue from the crude, after the gasoline and kerosene have been taken from it. Its price varies throughout the country, averaging at the present time \$1.20 to \$1.30 in Chicago, and \$1.50 to \$1.60 in New York. At \$1.20 the price is 10 cents and at \$1.60, 12 cents. With oil at 50 cents per barrel the cost would drop to 7.8 cents and with oil at \$2.10, the price would be 13.9 cents. These figures are for a \$20,000 plant which would have a monthly capacity of about 5,000 barrels. Seventeen per cent. of the fuel oil becomes gasoline, 10 per cent. is lost in the process, and 73 per cent. remains fuel oil and may be sold at the same figure at which it was purchased.

BOSTON DEALERS NOT JUNK MEN

According to Judge Burk, of the Boston Municipal Court, the automobile dealers whose regular business is that of selling new vehicles, need not take out a license as a second-hand dealer. Several months ago police officials distributed application blanks to every garageman requesting him to fill out and pay a fee as a second-hand dealer, the same as pawn brokers and junk dealers. The Boston Automobile Dealers' Association and the Boston Commercial Vehicle Dealers' Association, working together, notified their members to refuse to take out a license, stating that if they did they would have to obey all the terms of the law. This meant that when they took in a second-hand truck, they would have to send a description of it to police headquarters, and also have to hold the truck for 30 days before disposing of it, and this latter provision would break up many sales. The decision just rendered clears up a much mooted question.

The CCJ has most advertisers because it gives them biggest returns

FIRST SIX MONTHS' GASOLINE OUTPUT BREAKS RECORD

Figures compiled by John D. Northrop, of the United States Geological Survey, have it that 14,000,000 barrels of petroleum were marketed in the United States during the first half of this year. This quantity, which includes a little oil actually produced in 1915 and marketed in 1916, is appreciably less than the output during the first half of 1915, though it is greater by about 5,000,000 barrels than one-half the entire quantity marketed last year.

SAN FRANCISCO HAS NON-SKID STREET PAVEMENT

This street pavement is designed to eliminate skidding, this being accomplished by making the surface rough enough to prevent the car from sliding on rainy days, and smooth enough to allow comfortable riding. A top binder of crushed rock, mixed with asphalt, is used and the whole rolled smooth with a 15-ton roller. Teamsters using the streets state that their horses secure a better footing than on the smoother surfaces.

FORD TO BUILD \$8,000,000 PLANT

Work will start in the Fall on the new plant of the Ford Motor Co., at the intersection of the Pere Marquette Railroad and the River Rouge, which will house the blast furnaces and automobile parts plant. This plant will be separate and apart from the projected tractor plant, plans for which are well under way. Arrangements have been made for the delivery of ore direct by vessel to the Rouge plant, and the company will thus be in a position to manufacture the greater part of its car from the ore to the finished product. The Ford Co. has contracts with parts makers which in some cases run for a number of years, but the enlargement of the auto plant in Highland Park will call for so much more material that the product of the projected plant will be taken up without difficulty.

It is also stated that Mr. Ford has been offered \$200,000,000 for his plant, which was refused.

OBERDORFER TO MAKE BUSHINGS AND BEARINGS

The M. L. Oberdorfer Brass Co., of Syracuse, N. Y., has announced its intention of going into the finished bronze bushing and bearing industry for automobiles on a very large scale. This concern is very well known in the automobile industry, as a manufacturer of brass gear pumps. The company has in late years been gradually building up the bearing and bushing end of its business, and the plant is now equipped with labor saving devices and all sorts of gages and machines for accurately turning out bearings, kept within any tolerances specified. The metal making up these bearings is compact, close grained and homogeneous and of the proper mixture to insure long life. On plain bushings there is no pattern charge.

GOVERNMENTS VIE FOR TRUCKS

In a spirited but good-natured international tussle for forty F-W-D trucks between the United States and British government officials, Uncle Sam came out by a narrow margin.

On Friday morning, June 30th, 38 F-W-D trucks were on board the cars at the Clintonville, Wis., factory and the train was ready to move to New York.

These 38 trucks had been inspected by the British army officers and O.K.'d. Nothing remained but to ship them. Early Friday morning an urgent wire came from Washington, asking for forty trucks to go to Mexico at once. The F-W-D officials, after a conference of all parties concerned, decided that Uncle Sam's need was greater than that of John Bull's, and the trucks left Clintonville, Friday evening, bound for El Paso, Tex., instead of New York City.

The entire 38 trucks were repainted from the British gray to the U. S. Army drab without removing them from the cars, in order to get the shipment out on time. The other two trucks were shipped the following day.

H. & N. CARBURETOR COMPANY ANNOUNCES CHALLENGE

A somewhat unusual challenge was recently made by the H. & N. Carburetor Co., 1790 Broadway, New York City, makers of the H. & N. carburetors. The challenge extends to all carburetor manufacturers whose carburetors are now used as standard equipment on any make of automobile, asking them to send a stock carburetor with their own demonstrator to the American Automobile Association, the Society of Automobile Engineers, or the Automobile Club of America, for the purpose of submitting to an exhaustive test to determine which is the most efficient instrument under all conditions of speed and load.

The H. & N. company offers to pay all the expense of these tests, and in the event of any carburetor equalling the performance of the H. & N., they offer to pay all the costs of advertising the result for the benefit of the carburetor proving its superiority.

THE GOODYEAR HAND-ATTACHABLE TIRE

A new addition to the motor truck tire field is the Hand-Attachable Cushion Tire just introduced by the Goodyear Tire & Rubber Co., Akron, Ohio. This tire is designed for use on motor trucks and fire apparatus. As its name suggests, it can be applied to the wheel by hand, a particularly desirable feature in tire equipment.

The new Hand-Attachable has a channel base identical in construction with that of the Goodyear S-V Tire. The tread design is non-skid, and is the same as that of the Cushion Demountable, but the pockets or indentations in the sides of the tire that provide accommodation for the displaced rubber as the tire revolves on the street are changed from rectangular to oval shape.

The new tire is claimed to be tougher, more resilient and to resist road punishment better than the type which it supersedes.

N. G. E. A. HOLDS ANNUAL MEETING IN CHICAGO

The National Gas Engine Association held its annual session from June 27 to June 30 at the Hotel Sherman. During the session of the 28th, three interesting papers on gasoline tractors were read: "Tractor Engines," by W. J. McVicker; "Tractor Design," by Wm. A. Harty, of the engineering department of the International Harvester Co., and "Tractor Drawbar Ratings," by Raymond Olney, editor of Gas Power. The session of the 29th was given over to the fuel question. Carburetion was the subject of a paper by E. E. Dean, chief engineer of the Byrne Kingston Co.; E. E. Grant spoke on fuel, and E. W. Roberts discussed liquid fuel, present and future.

Holihan Mfg. Co., manufacturer of hubs, tanks, fenders, etc., 21st St. and W. Jefferson Ave., Detroit, has recently purchased 3½ acres of land on Milford Ave. and Pere Marquette Railroad. A large factory building, 80 x 400 ft., with adjoining buildings for storage, shipping, enameling, etc., will be immediately erected. It is expected that by September 1st the new plant will be occupied and production doubled.



Copyright by International Film Service.

United States Army Menaced by Mexicans

Truck Company 9, U. S. Army, halted on the wayside en route into Mexico, to repel an imaginary force of Mexicans. The trucks act as convenient barricades from which the men may fire

The CCJ leads in circulation, advertising and prestige

Personal Items

Herbert J. Flint has joined the force of the J. C. Wilson Co., of Detroit, as general sales manager.

J. Elmer Pratt, for seven years sales manager of the Pierce-Arrow Co., Buffalo, N. Y., has formed the Higrade Motors Co., to manufacture a truck between a heavy duty truck and a light delivery wagon.

L. W. Bitting has been appointed managing director of the Studebaker Co., of Australia, and will make his headquarters at Sidney. Mr. Bitting has been in charge of the Long Island territory.

D. K. Moore has been appointed to the position of assistant to the general manager for production of the Vim Motor Truck Co., Philadelphia. In this capacity he will have charge of materials and will supervise production.

William H. Lolley, formerly connected with the Simms Magneto Co. and the Remy Electric Co., has joined the selling force of the Timken Roller Bearing Co., Canton, Ohio, and will now represent the Timken Co. throughout the East.

B. C. Swinehart, Philadelphia manager for the Republic Rubber Co., is now manager of the truck tire department at the factory at Youngstown, O. Mr. Swinehart has had considerable experience with truck tires from his previous connection with the Swinehart Tire & Rubber Co.

Gordon Smith, Philadelphia sales manager of the Vim Motor Truck Co., Philadelphia, Pa., has been appointed sales manager of the Manhattan Motors Corp., New York City, distributor of the Vim. He has been succeeded in Philadelphia by J. P. Cranston, formerly with the Bateman Mfg. Co., Glen Rock, N. J.

Chas. G. Percival, formerly connected with the Abbott Motor Car Co., Jackson Motor Co., etc., has been appointed motor truck editor of the New York Globe. He was the first man to drive a motor truck into the Arctic Circle by way of Skagway, Alaska, and Dawson, Yukon territory, and was instrumental in introducing motor truck delivery into the Yukon valley.

Emilen S. Hare has become manager of the Packard Motor Car Co. of New York. He will handle the sales end of the business under E. B. Jackson, president of the company. Mr. Hare is a Philadelphian, with wide selling experience in the motor truck field. In January of this year he became connected with the Packard organization as special representative of the motor truck department, and was lately appointed manager of that department.

Allen Loomis, for the past ten years connected with the Packard Motor Car Co., has resigned his position as research engineer to devote his attention to private engineering. He will make an announcement regarding the details of his work upon his return from his home in Higgins Lake, where he will spend July and August. During his long Packard connection, 39 patents were granted to him, many of which are embodied in the modern Packard cars. A number of other applications are pending.

"There are fifty different KINDS of road and fifty different pet names for 'em. All are more or less efficient. It's gettin' ONE of 'em in your community that counts. Our great-great grandfathers went to market in mud hub-deep. Just thinking about th' way their wagons an' buggies uster look ought to be enough to make US run for a bag uv cement."

New Incorporations and Trade Changes

Gramm Motor Truck Co., Lima, O., increased its capital from \$2,500,000 to \$5,000,000.

Ohio Detroit Trailers Co., E. Cleveland, O., has changed its name to the Ohio Trailers Co.

Hylo Sales Co., Inc., distributor for the Smith Form-A-Truck Co., of Chicago, has moved to new building on Mt. Royal Ave., Baltimore, Md.

Bell Motor Car Co., York, Pa., has increased its capital to \$1,000,000. A factory will be erected at Rockburn Station in East York upon a 15-acre tract.

Corliss Motor Truck Co., Corliss, Wis., has established a large commercial car factory in plant formerly occupied by the defunct Wisconsin Engine Co.

Staybestos Mfg. Co. has opened service station in Detroit. Business in that city was formerly represented by the Chas. E. Wade Sales Co.

Comet Automobile Co., with offices in the Rockford Trust Bldg., Rockford, Ill., has been formed to manufacture pleasure and commercial cars. Capital stock, \$1,000,000. The pleasure car will be known as the Comet; it will have six cylinders and a wheelbase of 112 in. The price will be about \$800, while the truck will sell at about \$1000. The officers of the new company are: Harry R. Sackett, Chicago, president; Jos. Callahan, Chicago, vice-president, and Geo. W. Jagers, treasurer and general manager.

LARGE PARTS PLANTS TO BE MERGED

The Steel Products Co., Cleveland, manufacturing valves, spring bolts, and other hardened and ground parts; the Michigan Electric Welding Co., of Detroit, manufacturing drag links, brake, torsion, radius and other rod assemblies, head lamp brackets and round stock spring clips; The Metals Welding Co., Cleveland, manufacturing acetylene welding equipment, high speed cutting tools, and doing a large business in automobile welding work, have merged under the name of The Steel Products Co., with main offices in Cleveland. The capital of the consolidation is \$4,000,000.

The plants will continue to operate under their own names as subsidiary plants of The Steel Products Co. The consolidation is expected to effect the usual economies of large scale production and will considerably broaden the service offered to the car builder. The consolidation will undoubtedly be developed along the same line as The Steel Products Co., which has become known to the trade as the "valve department." The equipment owned by the new company covers the most important processes in automobile manufacture, such as metallurgical work, heat treating, precision grinding, polishing, electric welding, acetylene welding, besides automatic machine and general steel manufacturing equipment. The officers of the company are: C. E. Thompson, president; W. D. Bartlett, vice-president; J. A. Krider, secretary and treasurer.

Nevada Truck & Tractor Co., Nevada, Ia., has been dissolved and the patents sold to a Minneapolis concern.

New Truck Agencies

Curtis Chamberlain, Madera, Cal., has taken the Vim agency.

Sanford Street Garage, Springfield, Mass., has taken the agency for the Atterbury truck.

Vim Motor Truck Co., Philadelphia, Pa., has opened an agency at 204 Washington Ave., Albany, N. Y.

Standard Motor Truck Co., Detroit, Mich., opened salesroom at 2241 Cottage Grove Ave., Chicago, for Standard trucks. C. W. Rhoades is manager.

Maypole Motor Sales Co., 2642-44 Michigan Ave., Chicago, Ill., has taken agency for the Sanford truck in Illinois, Wisconsin, Iowa and Northern Indiana.

R. J. Hancock, of the Colon Traders Co., Melbourne, Australia, has taken the agency for the Redden Make-A-Truck and Redden trucks of all styles in Australia.

E. J. Stern, identified with the automobile trade for several years, has taken the agency for the Palmer-Moore truck and has opened an office at 1777 Broadway, New York City.

Eugene J. Ellis, formerly assistant truck sales manager of the Packard Motor Car Co., has taken the territory covered by John J. Mandery, deceased, and will handle the agency for Packard cars and trucks under the name of E. J. Ellis & Co., Rochester, N. Y.

Republic Motor Truck Co. of Mo., St. Louis, Mo., has been organized to distribute Republic trucks in St. Louis and the eastern half of Missouri and Southern Illinois, with the following officers: L. E. Fischer, president; B. W. Hilgard, vice-president and treasurer, and W. L. Murphy, secretary. The main office is at 930 Boatmen's Bank Bldg. and the showroom and complete service station at 16th and Chestnut Sts.

Four Wheel Drive Auto Co., Clintonville, Wis., has recently appointed the following new dealers: C. C. Dawson Co., 631 Brandeis Theatre Bldg., Omaha, Neb.; C. C. Dawson Co., 422 Hubbell Bldg., Des Moines, Ia.; Clarence C. Gray, St. Paul, Minn.; Four Wheel Drive Truck Co., 343 Golden Gate Ave., San Francisco, Cal.; Four Wheel Drive Truck Co., Los Angeles, Cal.; Shaw Motor Co., 629-31 S. State St., Salt Lake City, Utah; Geo. E. Roberts, 616 Grand Ave., Milwaukee, Wis.; C. W. Johnson, Lewiston, Mont.; and J. M. DeFord, 203 Trussed Concrete Bldg., Detroit, Mich.

Mack Motor Truck Co., recently received an order from a Boston coal company for 13 Mack trucks for immediate delivery.

Four Wheel Drive Auto Co., Clintonville, Wis., recently received another order from the United States Government for 28 three-ton transport trucks and 5 additional 600 gal. tank trucks.

Atlanta Electric Vehicle Co., Newark, N. J., reports a recent demonstration of its one-ton truck running 52 miles on one battery charge. The run was made through heavy sandy country and the result very agreeably surprised the prospective buyer.

The Northwestern Military Academy, where young men are instructed in the art of soldiering, has recently placed an order for one of the Warner trailers of the prairie schooner type, made by the Warner Mfg. Co., of Beloit, Wis. The trailer will be considered as standard equipment by the academy.

Velle Motor Vehicle Co. recently received an order from Kansas City, Mo., for fire apparatus, which is claimed to be the largest order for fire apparatus ever entered with a single firm. Twenty pieces of various types were purchased—combination hose and chemical cars, ladder trucks, service trucks, etc., amounting to more than \$100,000.

National Automobile Chamber of Commerce Approves Service and Repair Parts Policies



SOLUTION of the problem of giving fair and better service to buyers of motor cars by the manufacturers and dealers was reached at the annual meeting of members of the National Automobile Chamber of Commerce held recently in New York.

The members voted unanimously to approve a form of standard service policy to be put into effect between the members and the purchasers of their cars and also approved a standard repair parts policy to become operative between the manufacturers and their distributors and dealers.

These two policies are the outcome of the service managers' convention held in Detroit last year and embody the results of careful study and recommendations made by the service managers' associations of Indiana and Michigan, organized last year, and of two special committees appointed by the N. A. C. C., of which Percy Owen (Liberty) and E. T. Klee (Stutz), were the chairmen.

The purpose of the service policy is to provide a definite basis which will insure that every owner will get fair treatment in the matter of service. The policy applies to motor trucks and delivery wagons as well as to passenger cars.

It is expected to eliminate the misunderstandings that arise through the vague promises of service that are sometimes made by salesmen and dealers, generally verbal.

This new service policy, which is intended to be printed in poster form and placed in a conspicuous place in the salesrooms and service stations of the manufacturers and dealers, will inform every purchaser just what service he is entitled to, so he will have no hesitancy about asking for it.

The service policy is as follows:

N. A. C. C. STANDARD SERVICE POLICY

The Blank Motor Car Co., through its dealers, aims to give all purchasers of Blank cars uniformly fair, courteous and business-like treatment and to assist them in every reasonable way to keep their cars in good running condition.

The principles of the policy are:

First—To fulfill the obligations assumed under the manufacturer's warranty.

Second—To furnish repair parts as promptly as possible at our current prices.

Third—To maintain facilities for making repairs, adjustments and do general overhauling in a prompt and competent manner at reasonable charges.

Fourth—To make inspections and adjustments, not necessitated by neglect or abuse, free of charge for one month following delivery of a new car to purchaser, and thereafter at our regular prices.

Fifth—To furnish printed instructions in the operation and care of our cars.

Sixth—Service to be rendered does not include furnishing repair parts or labor without charge, except as provided in the warranty and in the following specific clauses of this Service Policy.

Replacement of Defective Parts

(a) Within ninety (90) days after delivery of a new car to purchaser the Blank Co. will furnish, free of charge at the factory, duplicate parts to replace any parts as covered by our warranty that are returned to the factory with shipping charges prepaid and which are determined by the company to have been defective in material or workmanship, or it will put such parts in condition as good as new without charge.

(b) Within ninety (90) days after delivery of a new car to the purchaser the dealer will install, free of labor charges, any parts that the factory furnishes or repairs free of cost to replace any parts determined by the factory to be defective, the purchaser to assume cost of replacement parts and installation of same pending factory decision.

(c) The party returning the parts will be notified promptly of the decision of the factory regarding allowance of a claim for replacement or repair of parts returned.

Inspection and Adjustment

(d) Cars brought to service stations maintained by factory, branch or dealer will be inspected and all necessary adjustments will be made as in paragraphs (e) and (f), without charge during the first month after delivery of a new car to purchaser, provided the car has not been tampered with or injured by accident or neglect. After the first month adjustments will be made at the regular charges of the service station.

(e) Inspection includes examination and report of the condition of the car.

(i) When any charge work is to be done and the cost can be estimated in advance, the owner, upon request, will be advised of the amount of the charges before work is begun.

(j) When it is necessary, for the convenience of the owner, to render service at a distance from the service station, the time spent by employees going to and from the job will be charged for at the regular rates of the station, together with all proper expenses of making the trip, cost of shipping parts, if any, and other necessary incidental expense.

Overtime Work

(k) Any overtime, holiday or Sunday work done upon the request of the owner will be charged for at the regular overtime rate.

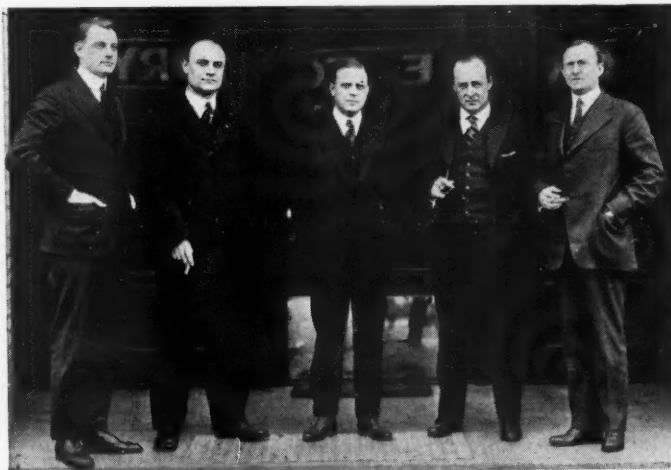
Instructions in Care and Operation

(l) Instructions in printed form regarding the care and operation of the car and its accessories, and proper method of ordering and returning parts, will be given to the purchaser upon the delivery of the car.

(m) Personal instruction will be given in accordance with the agreement between dealer and customer at the time of purchase.

General

(n) For service and replacements on engine starters, batteries, magnetos, generators, lamps, carburetors, tires, rims or other trade accessories that are not made by the manufacturer of the car, application may be made direct to the nearest service station



Members of N. A. C. C. Standard Service Policy Committee

From left to right they are H. W. Drew, Nordyke & Marmon Company; A. B. Hanson, Service Motor Truck Company; Percy Owen (chairman), Liberty Motor Car Company; Charles Gould, Maxwell Motor Company; C. R. Lester, Packard Motor Car Company.

(f) Adjustments includes only such adjustments as inspection has found necessary to put the car in good operating condition.

(g) Every dealer is expected to give the same inspection and adjustment service on the cars made by this company without regard to the territory in which they were bought.

Repairs, Replacements, Etc.

(h) All work not included in inspection, and necessary adjustment during the first month, or installation of replacements under the warranty, will be charged for at regular rates.

maintained by the maker of such accessory. Dealers will be provided with a list giving names and addresses of the manufacturers of said accessories.

(o) No promise of service, free repair work, inspection or adjustment, except as herein specified, given or made by the dealer, shall be binding on the manufacturer of the car.

(p) To help the dealer carry out the intent of this Service Policy, the owner is requested to furnish all information necessary to the prompt and proper filling of orders and issuing of credits and to ob-

The CCJ is the only truck publication a member of the Audit Bureau of Circulations. There's a reason!

serve the requirements regarding return of parts with claims for replacement.

(Signed) THE BLANK MOTOR CAR CO.
(Address).....

N. A. C. C. STANDARD REPAIR PARTS POLICY

The purpose of this policy is to place the relations between the Blank Motor Car Co. and its dealers on a definite, fair, uniform and businesslike basis.

- (1) **Stock of Parts**—The dealer will be required to maintain a minimum stock of both "current" and "service" parts as specified by manufacturers, to be paid for by the dealer on or before the 20th day of month following delivery.
- (2) **Censoring of Orders**—To prevent the overstocking of inactive parts by the dealer or the purchasing of an excessive stock of any parts, the right is reserved by the manufacturer to reduce in quantity the number of pieces of any part or parts ordered by the dealer.
- (3) **Inventories**—The dealer will be required to furnish an inventory of current and service parts upon request. The manufacturer reserves the right to send an auditor to verify inventories and reduce or increase stock as he sees fit in accordance with Clause No. 1.
- (4) **Shipments to Dealers' Territory**—So far as possible, the dealer will be required to see that all orders for parts from his territory are placed through him.
- (5) **Discounts**—Discounts to garages or repair shops will be at the discretion of the manufacturer.
- (6) **Designation of Parts Stocks**—Stocks of parts shall be designated, as follows:
 - (a) **Current Parts**—All parts used in cars or models being produced by the factory.
 - (b) **Service Parts**—All parts for models no longer being produced by the factory and which have not been superseded by other parts that are interchangeable with them.
 - (c) **Obsolete Parts**—Parts that have been superseded by other parts that are interchangeable with them.
- (7) **Return of Parts**—
 - (a) **Defective**—Parts claimed defective under the 90-day warranty must be returned to the factory, with shipping charges prepaid, within 30 days from time defect claimed manifests itself.
 - (b) **Obsolete** parts shall be returned only as ordered by manufacturer.
 - (c) **Surplus** parts may be returned only by individual arrangement with the manufacturer.

All parts shipped to the manufacturer by dealer shall have transportation charges prepaid, and be properly tagged.
- (8) **Notification of Owner**—The manufacturer reserves the right to communicate direct with owners concerning replacement and disposition of parts returned.
- (9) **Disposition of Returned Parts**—The manufacturer reserves the right to dispose, within 30 days, of parts returned, without assuming liability unless covered by shipping instructions or adjustment is accepted.
- (10) **Parts Purchased or Made Outside of Territory**—The manufacturer will refuse to consider claims for or accept for adjustment any parts not supplied by him.

(Signed) THE BLANK MOTOR CAR CO.
(Address).....

N. A. C. C. DEFINES STANDARD TRUCK CHASSIS

Definitions of standard truck chassis were recommended for adoption by the N. A. C. C. at the general meeting of the truck members held June 7 and were approved at the annual meeting of the association the following day.

The object of these definitions, suggested by Windsor T. White, chairman of the Commercial Vehicle Committee, is to indicate what minimum parts, finish and equipment constitute the standard chassis for gasoline and electric commercial cars. The definitions are expected to simplify the compilation of catalog specifications and the making of quotations by cable, telegraph and letter, and will be of great protection to the buyer in judging values and making purchases. They read as follows:

Definition of Standard Chassis for Gasoline Commercial Cars

A standard chassis of a commercial car to be propelled by an internal combustion engine shall consist of an assembly of all essential parts of a truck chassis with protective housings, ready for operation on the road, including set of tires attached to wheels; driver's seat with padding or cushion on all chassis rated at one-ton capacity or more; front wheel fenders; running board or mounting step; tool compartment; priming coat of lead on all parts to be painted; pair of front lights and one tail lamp; license brackets; warning signal, jack and a set of tools commonly used for making adjustments and minor repairs on the road.

Definition of Standard Chassis for Electric Commercial Cars

A standard chassis of a commercial car to be propelled by electricity shall consist of a running gear, motor, battery cradle or box, driving and control mechanism and wiring, with all essential parts, fittings and protective housings thereof, assembled complete ready for operation on the road with the exception of a battery; a priming coat of lead on all parts to be painted; set of

tires attached to wheels; pair of front lights and one tail lamp, with necessary wiring installed; license brackets; charging plug and cable, odometer; warning signal and set of tools commonly used for making adjustments and minor repairs on the road.

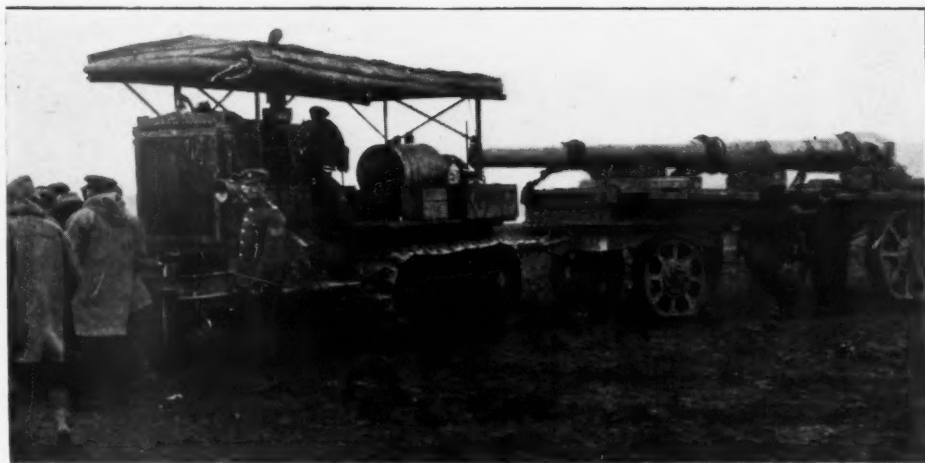
GARAGEMEN IN NEW YORK WILL APPEAL IN SEPARATOR CASE

The Appellate Division of the Supreme Court has given a decision reversing that of Judge Philbin in the lower court and holding the New York separator ordinance valid. The ordinance requires the installation of an oil separator in the sewer line of every garage with a capacity for more than four cars in order to prevent gasoline and oil from reaching the sewers. The garagemen are determined to take the case to the highest court and a decision from this is not expected before next winter. In the meantime, the city authorities cannot enforce the ordinance. The garagemen contend that the separators are not practical, that not enough gasoline reaches the sewers to cause an explosion, and that the devices are too expensive. The Fire Department claims that efficient separators can be made and installed for \$200.

FORD MOTOR COMPANY THIRTEEN YEARS OLD

The Ford Motor Co. is just 13 years old. When the company was organized in 1903 the Detroit factory employed 311 men and completed a fiscal year's output of 1708 cars. In June of this year the company employs 31,000 men and is turning out 500,000 cars. There are 28 branch factories in this country, besides the Ford Motor Co. of Ford, Ont., which employs 2500 men and the Ford Motor Co., of Manchester, Eng., with 2,000 on its payroll.

Wilcox Motor & Mfg. Co., Saginaw, Mich., has been incorporated with a capital stock of \$150,000 for the purpose of manufacturing motor car engines. The organizers are Rollin H. White, Cleveland, Ohio, and M. L. and M. M. Wilcox, of Saginaw.



Caterpillar Drive Hauls Big Guns Over Soft Earth

Because of the softness of the earth the moving of the big guns which were placed in position for the defense of Saloniki was one of the difficulties which presented itself to the Anglo-French forces when the defence of Saloniki was planned. Giant tractors with caterpillar wheels, which are capable of going over any kind of soft ground, are used. The illustration shows one of these big tractors hauling one of the big, heavy, British guns.

Another Phase of Preparedness

By RUSSELL HUFF, President Society of Automobile Engineers



NOT so long ago the motor-car industry was a struggling infant, and yet in a very short space of time it has grown to be a vigorous adult. The prosperity it has brought to this country, especially in periods of depression, has been enormous. Prior to its advent, which was accompanied by so much that was new in the mechanical world and by such rapid growth, the organizations within the control of our Government had no difficulty in keeping pace with engineering activities of all kinds. The Army, the Navy, the departments of commerce and the many active Governmental Bureaus could meet new engineering situations as fast as they arose.

But the development of the motor car, motor truck, tractor, submarine, high-speed motor boat, the hydro-aeroplane, aeroplane, dirigible—all using the internal-combustion engine—has been so rapid as to require the closest alliance of the Government organization with the outside engineering world. The problems connected with the development of these types of apparatus are of a highly technical nature, while the multiplicity of accessories attached to their operation requires every sort of engineering activity. Moreover, the engineers and commercial men dealing with one device deal with all to a greater or less extent.

The members of the Society of Automobile Engineers move from one manufacturing activity to another, and thus their industrial ramifications are endless. Builders of engines are of necessity familiar with and needed by all. The men who furnish iron, aluminum or brass, deal alike with all. Those making carburetors, tanks, gages and radiators similarly serve all of these industries, as do also the manufacturers of electric lamps, storage batteries and of ignition and starting devices. Rubber, fabrics combined with rubber in many forms, gaskets, tires and hose are continually and increasingly used by motor car and aeronautic engineers. The dirigible and motor boat will also draw heavily on the rubber and other industries mentioned.

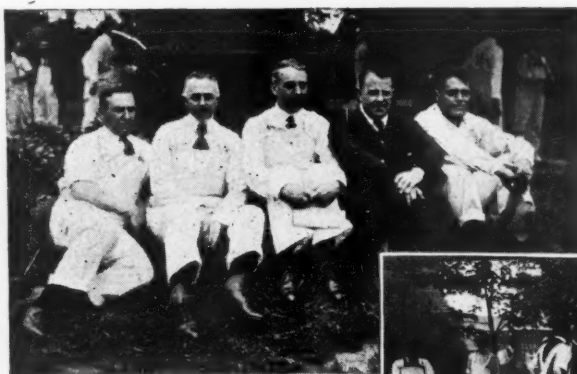
The rapid advance in the design and construction of air, land and water transportation mediums, as exemplified by the aeroplane, automobile and motor-boat, has naturally resulted in the formation of plans that permit complete co-operation in all engineering matters between Government and commercial activities. An evidence of this co-operation is the recent creation by Congress of the National Advisory Committee for Aeronautics. A long step forward is thus taken in the rapid development of the aeroplane and dirigible industry, a development now urgently demanded by popular sentiment in the United States and absolutely needed by our Army and Navy, if the aviation service is to be efficient in any modern sense. The committee is composed of representatives of the Army, Navy, Smithsonian Institution, U. S. Treasury,

Bureau of Standards, U. S. Weather Bureau and of scientists who have taken a prominent part in the development of the aeroplane.

The members of this body represent the broadest selection of practical and scientific knowledge, and are backed by unusual and wide Congressional authority. It has now taken the initiative and opened communication with the engineering and manufacturing world. A sub-committee on aviation motive power has been selected and authorized to act in conjunction with the Society of Automobile Engineers. It is understood that this sub-committee will include in its investigations the many accessories that are a part of the modern aviation engine and will take action at once to forward the adoption of uniform standards and specifications for its construction. The members of the sub-committee are: Dr. S. W. Stratton, of the Bureau of Standards; Lieut. Col. Squirr, Aviation Division, Signal Corps, U. S. Army, and Capt. Bristol, U. S. Navy. These officials have selected as working assistants Dr. H. C. Dickinson, Bureau of Standards; Henry Souther, past-president of the Society of Automobile Engineers, and now consulting engineer, Aviation Section, U. S. Army, and Lieut. Childs, U. S. Navy.

This combination of Government and S. A. E. strength should lead to results that will be based on the best knowledge obtainable from every source—scientific, engineering and commercial.

The 1st Regiment of Pittsburgh Volunteers has been offered 17 trucks by the Military Training Association of Pittsburgh. The sum of \$25,000 has been set aside for this purpose, but no definite action can be taken until the consent of the War Department has been obtained.



The men at the top from left to right are: O. J. Doolittle, vice-president; W. H. Metcalf, secretary; Judge Eugene Bonniwell; Lee J. Eastman, president and R. E. Chamberlain, retiring chairman of the Entertainment Committee.

PROHIBITS GASOLINE TANK CARS ON BOSTON STREETS

In order to prevent any possibility of sewer explosions in the metropolitan district of Boston, Fire Prevention Commissioner John A. O'Keefe has placed a ban on hauling gasoline through the streets in the big tank cars of the railroads. It was found that the gasoline and oil, when it came in from one line and had to be sent away from another, passed through the Union freight lines in Boston. This was done to save time, as the cars could be switched in the suburbs. The Commissioner requested that this not be done except in an emergency and the railroad officials agreed to the suggestion. When an emergency arises, the Commissioner will grant a permit and send a detail of firemen along to see that none of the fluid leaks into the sewers where it might cause an explosion.

PHILADELPHIA MOTOR TRUCK CLUB OUTING

Instead of holding its regular monthly meeting within the confines of a hotel, the members of the club "took to the woods" on July 14th, in the form of an outing at Kugler's Mohican Club, on the Delaware. This outing was the third annual outing of this association and crowned the final effort of R. E. Chamberlain as chairman of the entertainment committee. Mr. Chamberlain on the same day severed his connections with the Philadelphia Garford branch to become the sales director of Packard motor trucks in New York City.

The afternoon was given over to various athletic events, ending with a seven inning baseball game that had something on the big league stuff for excitement. The program consisted of a potato race, fat man's race, jockey and wheelbarrow events, tug-of-war, quoits and catching a greased pig.

In the evening a splendid dinner was served, after which prizes for the afternoon events were awarded. Plenty of brilliant speeches accompanied the prizes, which, to say the least, were out of the ordinary.



THE COMMERCIAL CAR JOURNAL

Entered as second-class matter at the Post Office at Philadelphia Pa.
under the act of March 3, 1879

Vol. XI

PHILADELPHIA, JULY 15, 1916

No. 5

Published the 15th of each month by the

CHILTON COMPANY

Market and 49th Streets

Philadelphia, U. S. A.

JAMES ARTMAN, President

C. A. MUSSELMAN Treas. and Gen'l Mgr.

GEO. H. BUZBY, Vice President

A. H. VAUX, Secretary

ADVERTISING DEPARTMENT

Eastern Mgr., C. MONROE SMITH, New York Western Mgr., C. C. McKINNEY, Chicago

EDITORIAL DEPARTMENT

JAMES ARTMAN, Editor-in-Chief

E. S. FOLJAMBE, Managing Editor

ALBERT G. METZ, Ass't Managing Editor

J. HOWARD PILE, Associate Editor

SUBSCRIPTION RATES

United States and Mexico One Year, \$1.00

Other Countries in Postal Union, including Canada, One Year, \$2.00

Make checks, money orders, etc., payable to Chilton Company

Change of Address — Subscribers desiring their address changed, should give the old as well as the new

The Commercial Car Journal is a Member of the
Audit Bureau of Circulations

THE SECOND-HAND TRUCK PROBLEM



IN this issue we have attempted to show, as far as space will permit, what is being done in various parts of the country with the second-hand commercial cars. From now on this will be one of the big problems which the dealers will have to solve. In the meantime, there will be the general percentage of failures due to poor business methods connected with sales of new trucks involving the exchange or taking in of old trucks.

There may be a few who are so fortunately situated that they can say: "We will have nothing to do with the second-hand truck market," but they are in the minority. Most truck dealers have the problem to face, and must meet it in their own characteristic manner. Whether they are successful or not will depend upon not only their judgment, but can and should be largely influenced by what has been done by the other dealer. It is just the same with the dealer in selling and trading in second-hand vehicles as it is with the inventor who tries to market a patented article or with a man who seeks to get a patent—a knowledge of the present status of the business is essential.

We, therefore, trust that the dealers will carefully read the experiences of others, which we herewith publish, and if they see where mistakes are being made, or if they have suggestions to offer as to how this great question of the disposal of second-hand trucks shall be settled, that they will write us. We, in turn, shall be pleased to make use of their communications in our columns for the benefit of the trade in general.

SLIDING SCALE OF DISCOUNTS



MANUFACTURERS are divided into two general classes, those who have a leaning toward long-time payments, and this is rapidly growing, sales, of course, being secured by suitable paper and those who are making every effort to teach their agents and distributors to sell as much on a cash basis as possible.

By this latter class, a sliding scale of percentages are offered the dealer, according to the kind of sale that he makes. For example, one truck maker offers his dealers for each cash sale 27½ per cent.; for each 6 months' sale, 24 per cent.; for 10 months' sale, 20 per cent., and where a year's time is given, only 18 per cent.

In the same way, manufacturers who desire to sell chassis only have occasionally as an inducement added 1 per cent. to each sale of this kind.

These facts are mentioned merely as showing how the manufacturer, by sliding percentages, may influence very largely the character of the sales made by his representatives throughout the country.

AFTER THE WAR?



THERE are, of course, a great many pessimists. We have them with us in the truck business. At present, their chief aim is to spread the "kill joy" thought that after the European conflict is over, the truck business is going to pieces.

Those of us who are fortunate enough to be optimists are enjoying the thought that the truck industry is becoming so firmly established during the continuation of the war, that it will be well able to take care of itself when the war closes. Just what the foreign demand for American-made trucks will be, it is impossible for anybody to predict, but why worry ourselves about the foreign demand? The needs of this country for commercial cars will be so great that the manufacturers will have difficulty in supplying them.

More and more, everybody realizes that the hauling of the world is to be done by motor power, and not by animals. A glance at the statistics show us that the 200,000 or 250,000 trucks in use are nothing compared with the hauling which is being done at the present time by horses and mules. It is variously estimated that from 2 per cent. to 3 per cent. is all that is now handled by motor and that from 3,000,000 to 4,000,000 commercial cars will be required by this country alone within the next 10 years.

We have already mentioned in these columns the tremendous increase in commercial car production and believe that there will be a foreign demand for American-made trucks of the better class after the war is over, even in addition to the unprecedented home demand, signs of which are already making their appearance. In other words, the future of the truck industry is assured, even if Europe never bought any more American-made vehicles.

Communication Department

THE DISPOSAL OF SECOND-HAND TRUCKS

We are large users of motor trucks (maintaining a fleet of thirteen) and find ourselves constantly confronted with the problem of what to do with our old equipment.

The normal age of a truck may be from three to eight years, depending on quality of material and workmanship used in construction, extent to which repairs are made during truck's use, severity of service exacted from the truck and degree of efficiency required to make a truck's operation profitable.

From this it may be seen that a truck may have outrun its period of usefulness in one sphere, while still in such condition as to be profitable somewhere else.

Thus the "second hand truck problem" is not one of finding an unsuspecting purchaser, who ignorant of the true condition of the old truck, may be duped into buying it. It is rather a problem of finding a field of usefulness where service conditions are less exacting and where a truck may honestly pay for itself.

This condition exists naturally and every centre of truck users is surrounded by a ready-made market for their superannuated motor vehicles. I refer to the farmer, the rural merchant, gardener, etc., who find that a horse conveyance limits his possibilities, but who could not or would not pay the price of new motor equipment.

His conditions are the reverse of those under which most trucks grow old and seemingly useless; he uses a truck but intermittently; an occasional trip to market or town. He does not demand excessive speed, two to four miles per hour being the average with horses. Loads are rarely over five ton and usually much lower. Appearance or noisiness is not a detriment to a truck as it would be in city use.

Also the original purchaser could economically afford to sell his truck for 15 per cent. to 25 per cent. of its cost when the time arrived that its cost of operation became excessive.

In fact from every viewpoint the country seems to be the logical field for trucks in their declining years.

C. B. MONTGOMERY,
Philadelphia, Pa. Union Paving Co.

SHOULD A SALESMAN RECEIVE COMMISSIONS ON ALL SALES IN HIS TERRITORY?

To the Editor:

If I recollect correctly, there appeared in your Journal of February last an article, relative to the status existing, or that should exist between the employer and salesman, and especially those working on a commission basis. I maintain that when a man is working without salary or expenses, in fact, strictly on commission, and has been assigned a restricted territory, he is entitled to a commission on all sales made in that precinct, whether or not he personally supervised the transaction, and particularly when the firm for whom he is working are fully aware of the fact that the said salesman is conscientiously and continually on the job.

To illustrate: For some months lately I have been on the road for a house in the motor truck line and cover the entire field. Incidentally some party, not knowing me personally, telephones an inquiry to the house, instead of reserving that investigation for me (as I see them every morning), one of the firm jumps into his auto and consummates the sale.

My argument is that I certainly am entitled to commission on the deal.

Be kind enough to publish this inquiry in your Journal and give your verdict of the same.—Commercial Traveler, New York.

ANSWER

There is no standard practice in this regard. Whether you, as a salesman, are entitled to a commission on all sales within your territory, whether made by yourself or not, is entirely dependent upon the wording of your contract with your house. Unless it is specifically stated that you are to receive commissions on all sales within your territory, you would certainly not be entitled to same. Contracts for selling trucks are often drawn up in this way.

However, it is customary to turn over to the salesman all inquiries coming from his territory, unless there is some definite and sufficient reason why the business should not be handled by that salesman. This is done somewhat on the same basis as a manufacturer would refer any inquiries received at the factory back to his agent or representative in the territory from which the inquiry came.—Editor.

Steel and Rubber Markets

Large Foreign Contracts Pending

At the time of this writing indications are that foreign orders will call for more than 500,000 tons of steel in finished and unfinished forms. A general survey of the steel situation indicates that business is no longer feverish. Whatever easiness has developed in the steel situation is for spot deliveries on which the premiums recently secured are no longer in evidence except for steel plates, for which the demand is large, with prices strong. Tremendous demands for shipbuilding steel are being made, while commercial car builders are making hurry calls for steel in view of the bids recently taken by the U. S. War Department. Quotations on July 7th were:

Steel Products Prices

Bessemer billets, per ton, mill.	.42 00	a
Open hearth, per ton, mill	.42 00	a
Sheet bars, per ton	.42 00	a
Forging billets, per ton, mill.	.65 00	a	70 00

Sheets

The following prices are for 100-bundle lots and over f.o.b. mill; smaller lots are \$2 per ton higher:

Blue Annealed Sheets—	Cents per lb.
Nos. 11 and 12	3.05 a 3.30
Nos. 13 and 14	3.10 a 3.35
Nos. 15 and 16	3.20 a 3.45

Box Annealed Sheets, Cold Rolled—	
Nos. 17 to 21	2.70 a 2.80
Nbs. 22 and 24	2.75 a 2.85
Nos. 25 and 26	2.80 a 2.90
No. 27	2.85 a 2.95

Galvanized Sheets of Black Sheet Gauge—	
Nos. 10 and 11	3.50 a 3.60
No. 12	3.60 a 3.70
Nos. 13 and 14	3.60 a 3.70
Nos. 15 and 16	3.70 a 3.80
Nos. 17 to 21	3.85 a 3.95
Nos. 22 and 24	3.95 a 4.05
Nos. 25 and 26	4.10 a 4.20

Above prices are for Bessemer stock. For open-hearth stock \$2 per ton advance is charged.

Iron and Steel at Pittsburgh

Bessemer iron, Valley furnace.	21 00	a	21 50
Bessemer steel, f.o.b. Pittsburgh	45 00	a
Skelp, grooved steel	2 35	a	2 45
Sheared steel skelp	2 45	a	2 50
Skelp, grooved iron	2 70	a	2 80
Sheared iron skelp	3 00	a	3 10
Ferro-manganese (80 per cent.)			
seaboard	175 00	a	250 00
Steel, melting scrap	15 75	a	16 25
Steel bars (contracts)	2 75	a
Black sheets, 28-gauge	2 90	a	3 00
Galvanized sheets, 28-gauge	4 50	a	4 65
Blue annealed, 10-gauge	3 00	a	3 25
Tank plates, 3/4 and heavier	3 25	a

Rubber Fairly Steady

The price of Up-River fine has been fluctuating between the 62 and 65-cent mark since our last report. Manufacturers are buying sparingly, in fact, they appear to be sufficiently stocked to take care of current consumption. Quotations on July 7th were:

Para—Up-river, fine, per lb.	65	a	68
Up-river, coarse	41 1/2	a	42
Island, fine	59	a	..
Island, coarse	28	a	..
Caucho, ball, upper	41	a	41 1/2
Caucho, ball, lower	40	a	40 1/2
Cameta	34	a	..
Ceylon—First latex, pale crepe	58	a	58 1/2
Brown crepe	57	a	57 1/2
Smoked sheets	58 1/2	a	59
Centrals—Corinto	41	a	..
Esmeralda	41	a	..
Guayule	36	a	..
Balata sheets	73	a	..
Balata, block	55	a	..
Mexican—Scrap	40	a	..
Frontera	41	a	..
African, Massai, red	..	a	..

Domestic Scrap Rubber

Tires—Automobile	5 1/4	a	6
Inner tubes, No. 1	25	a	..
Inner tubes, No. 2	10 1/2	a	11
Red	11	a	..

NEW OFFICERS FOR THE BUFFALO DEALERS' ASSOCIATION

At a recent meeting of the Buffalo Automobile Dealers' Association the following new officers were elected: President, Mason B. Hatch; vice-president, O. E. Oliver; treasurer, Charles K. Kane; secretary, John J. Gibson; directors, J. A. Cramer, Charles F. Monroe and Howard B. Smith.

COMMERCE AND SIGNAL FORM MOTOR TRUCK MERGER

The Commerce Motor Car Co., of Detroit, and the Signal Motor Truck Co., of Detroit, manufacturers of commercial vehicles and trucks, have been merged into the Signal-Commerce Motor Truck Co., under a holding company of \$6,000,000 capitalization and backed by Detroit capital. The new company is headed by Thomas Neal, formerly president of the General Motors, later chairman of the board of directors and now vice-president of that company.

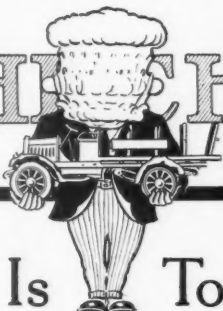
While the merger will be operated under a holding company until present contracts are filled, it is the intention ultimately to combine them in one complete plant.

The CCJ brings greatest returns to advertisers because of largest circulation among quantity buyers.

JUNK HEAP



WHICH?



USED TRUCKS



The Problem That Is Too Big to Tackle Alone

No Mystery: the Answer to the Second-Hand Problem is Already Known to Competent Dealers. Unity of Thought Now Achieved. When Will Come Unity of Action?

By FRANK REED



A NEW dealer was visited on the day of elation when he signed his contract by an old friend, deeply experienced in the motor truck industry. "Nothing to it. I've got it all figured out. This old saw about creeping before you walk and walking before you run—you go tell it to the marines. Watch me make a big splash the minute I jump in, and start the waves rolling. Man, I tell you I'm going to sell trucks."

So spoke Mr. Johnny Wise before his store was open.

"Suppose you tell me the dope," said the man who carried the scars of a few years in the game.

"Well, I'm going to start big. I'm going to get my trucks on the street. I'm after volume. To get it, I shall sell on time—liberal time. I will give 18 to 24 months. And I'm going to trade."

"I wish you luck, Johnny," and they parted.

A year later his friend dropped into the store. "How are you making out?" he queried.

"Jim, I guess I take the prize. Twelve months ago I had \$60,000 in cash. Look out this door," pointing into the garage back of the salesroom, "there's \$40,000 of my capital."

"And it certainly is one beautiful lot of junk," said his friend.

"Yes. But I've cut out the trading," replied the chastened optimist.

"The hardest and biggest problem before the trade. I am almost surprised that COMMERCIAL CAR JOURNAL has the nerve to tackle it. And every year it grows worse," is the terse comment of one seasoned sales manager.

Settling the second hand problem by discussion seems to be regarded very much like studying the diamond hitch in the home library and then going out west and trying to work out the diagram on a lazy and tricky mountain mule. Partial mastery comes only with experience—and real proficiency is never attained.

The logic of the thing is a good deal like that of the small boy whose father took him to task for losing his bright new jackknife.

"Dad," said the youth, "didn't grandma say nothing was lost if you knew where it was? Well, I know where my knife is."

"Where is it, son."

"At the bottom of the well."

Strong Dealers Not Letting it Bother

Trading has gone out of fashion with the strong dealers. Confidential discussion reveals the fact that there is a very substantial agreement in their experience, and the conclusions they have drawn, and action they consider best to take.

"We would do absolutely no trading if our strongest competitors would quit," is the commonest stand. A few have got to the point of "absolutely none, now," without reservations. But the special case still seems to be too much for the resoluteness of the average man in the trade. As far as the meeting of minds goes, the COMMERCIAL CAR JOURNAL is in a position today to prove that there is a good foundation for it. "If the dealers could only get together and stand fast for their convictions, they could settle it. But I don't think we'll ever get together" is the word of pessimism that finishes every dealer's talk on the subject.

The solution of the second hand problem already exists in their brains. Its working out depends on character—and, specifically, in confidence in the other fellow's character.

"One Breachy Critter in Every Herd"

Unfortunately, pleasure car precedents and early truck trade practices educated truck buyers into expecting trades as a legitimate service. Now that the fallacy of the principle is known to the trade, the fact that there is always some dealer willing to take in an old machine at an over-appraisal figure hampers those who know enough to quit.

A level headed dealer was urged to give a specific instance of a deal lost through a trade.

He told of a sale taken from him in this way by an unnamed competitor.

"Was his truck good enough to give you strong competition on its merits as a truck?" was asked.

"No, it was not."

"Was his concession so great that it is certain he lost money in closing out the complete transaction?"

"There is no doubt that he did."

"Was he financially strong enough to warrant taking the loss for some policy reason that may have satisfied him?"

"No. In fact, in almost every case the liberal trade-in dealer has his back up

against the wall, and is fighting for a little ready cash. His idea is: 'To thunder with tomorrow, I'll just look after today.' But he educates the buyers to an extent that makes it mighty hard for the rest of us."

Just Why the "Trade" Does Not Work

"Our experience has been that we cannot sell second hand trucks for the price we pay for them." These are the exact words of a dealer whose competitors a year ago frequently mentioned his trading. The same fact was stated of their experience by many other dealers. The best analysis of fundamental causes given by any dealer was as follows:

"It is suicide for any dealer to take in any second hand truck to sell as his.

"Any second hand truck is on the market for one of three reasons.

"That it is not suitable for the man's business in capacity.

"That the original buyer is not able to make the payments on it and the dealer takes it back and throws it on the market as a second hand.

"That the operating expense on the machine has gone so high that the owner cannot continue to operate it any longer.

"When a truck is thrown on the second hand market by a large concern it is almost invariably because its physical condition has deteriorated to a point where its owner cannot stand its operating expense.

"The second hand truck presents a different condition to the dealer from the second hand pleasure car. There is a place for the second-hand pleasure car: For example, the jitney business, the rent car business, and the family service of the man who uses it only for short evening rides and Sunday trips.

"The commercial car's operating expense must be low enough to permit the operator to handle the commodity he is moving at the price fixed by existing conditions.

"I have never been able to make a single second hand truck sale for all cash, or heard of anyone else doing so.

"The margin between the buyer's income from the use of the truck, and the cost of operating it plus his living expenses measures his ability to meet the paper the dealer is obliged to back.

"If the machine is broken down the dealer must furnish the repairs and give the buyer credit if necessary, in order to make the sale stand up.

"The total burden spells loss to every dealer at the prices fixed by trade-in competition."

Nature of Second-Hand Market

Buyers of second hand trucks seem to classify into a small number of businesses. And these are all weak businesses—and one of their main weaknesses is the assumed one of dependence on the truck for income. The main outlets for second hands are:

Junk dealers, one man baggage transfer, local or district "expressmen," fruit hauling by petty contractors, vegetable and poultry buyers and peddlers.

Ranchers take a few but not many. Just now in the west the mining business is opening up a market for them. They are bought by owners of poorly producing mines that are being reopened since war conditions shot up the prices of minerals. They realize that at the close of the war the prices of minerals will drop and they will probably have to cease working their mines. Accordingly they are buying second hand trucks because they represent less investment to be junked when this period arrives.

Seldom do business houses, except certain small businesses, buy second hands. Men of foreign nationalities are inclined particularly to buy second hand machines. Among such buyers are seldom found any with mechanical ability except, in the west, the Japanese. Others, however, as a rule meet their payments well because they are so thrifty and economical in their living habits.

Working Substitutes for the Straight Trade

Withdrawal from trading has been forced by economic pressure and common sense on a majority of dealers handling the trucks with well established market. Few are all the way out, but a good start has been made. One dealer has a "dead line" that limits his trading. As soon as he has \$3000 in second hands he accepts no more trades until he has worked some of it off.

Another firm which has quit trading meets a first advance on the topic by trying to argue the man into keeping his machine. It is looked over by a mechanical expert, with a view to finding the cost of getting it in good shape for service. A man who had owned a truck for two years came in and wanted to trade. He was induced to put it in the shop, and for \$150 it was put in condition to give as good service as when new.

If the man insists on disposing of his truck the dealer offers to try to sell it for him. He says:

"When we refuse to trade but offer to help sell a man's truck we are usually obliged to assume the paper. Invariably the second hand trucks are sold on terms. The owner's price is usually higher than the truck is worth. A man came in and wanted to get rid of his old truck before buying a new one. 'We will try to sell it for you. What's your price?' we said. \$1200 was his lowest figure. It will be easy to duplicate the truck for \$800."

Another dealer discusses the point as follows:

"A possible way for the dealer to take care of his customers who want to trade in is to take their old cars to sell as their agent, but not guarantee any amount. A plan which is being worked by a dealer in a certain high grade pleasure car might possibly do in the truck business. This dealer will allow a man who takes out a new \$2000 car and has an old car to sell on which he places a value of \$500 to turn in his old car to be sold at the best price the dealer can get and pay the difference between his asking price and the cost of the new car. If his old car is priced by him at \$500, for example, he pays in \$1500 cash. If the dealer gets \$600 for the old car he sends the man a check for \$100. If he can only get \$400 for it he sends the man a bill for \$100."

A third dealer who has had plenty of experience in trading, and hates it like poison, says:

"We are taking in trucks on an equity basis. If a man wants \$600 we will allow him \$350 and take that amount of equity in his car. We charge him 5 per cent. on the \$250 or any amount over \$350 that we get when we sell the truck. If he sets a price that is a little high and is inclined to insist upon it we keep getting offers and advising him of the best offers and giving him a chance to try and raise them, and seldom find anyone inclined to hold out too long for an unreasonably high price.

"Of course this puts on us the burden of making two sales to make one sale of a new truck and we have to handle two sets of paper."

Inferior Rating of Second-Hand "Paper"

The notes taken in on second hand trucks deferred payments represent an expense and source of bother to the dealer in addition to the loss due to the necessity of making two sales to dispose of one new truck and regardless of the possible evil of overvaluation.

If the dealer is very strong financially his bank will take in the second hand paper on the same basis as that issued on new trucks. As a rule, however, banks make inquiry, and look up the purchaser of the truck and in general look with some disfavor on much paper of this class.

This turns the dealer to note brokers for relief. Some note brokers double their interest rate on money advanced on this paper. They gouge heavily on discounts in a variety of systems of reckoning. The extra toll runs from 2 to 10 per cent. A dealer describing these various methods of computing his discounts referred to the brokers heartily as "loan sharks."

The risk on the very old truck has to be practically all assumed by the dealer. The older it is the higher the cost of insurance, and the very old trucks cost so much to insure that it is cheaper to take the risk. But if one of these does get wrecked it is a total loss.

The Trade-In as a Business Getter

The only possible off-set to the trade-in on new business is agreed to be reduced ex-

pense in selling—theoretically. But this expense is in practice transferred to the second hand machine, with additions. A big dealer says:

"The cost on the old truck loses the profit on the new one, so what is the use? The take-in price is set by the competition in the trade. There is always some new agency willing to pay for the privilege of making sales. He sets the pace that the older ones must follow.

"The big firms whose business is so attractive to the dealer that he considers it has an advertising value for his products are making the most trouble on trade-ins. If trucks they turn in are pretty old the dealer finds it is good policy to junk them and sell the parts or make trailers. It is probably even better to make a straight discount and leave the old trucks on their hands, as every old truck is a bother and expense to the extent that it must be sold on time, the buyer's paper carried and the dealer has to either assume a certain responsibility or risk of keeping it running or be bothered with continual arguments with the purchaser. Every buyer of a second hand truck seems to expect the same service on it that a buyer of a new truck gets."

One prominent dealer says furthermore that very often the second hand trucks not of their own make kill future sales.

"A man goes to the dealer in the Extragood truck and buys for about \$300 a junk truck made by the Punkerins firm, which has gone out of business. When people 'kid' him about being in trouble so much, and ask him where he got the old junk, he says: 'Oh, this is from the Extragood people. They stung me fine.' Sometimes he will even say straight that it is an Extragood. Of course, he will never admit that his mechanical judgment was at fault, or that he was told by the dealer frankly that it was junk and that he was getting it at a junk price. His line of talk is no asset to the firm that sold him."

Another feature is the possibility that a prospect with money enough to buy a new truck will switch to a second hand. This does not seem to bother the trade. A big dealer says:

"As a rule none of our second hand car prospects would buy a new car. However, some of them do kill the sales of new cars. An actual example is the case of the man who bought several thousand dollars worth of trucks for service in a new business he had acquired. The business did not pay and he got out of it. Having the trucks on his hands he came to us and asked us to help him get rid of them. As he had been a good customer we did so to accommodate him and as the trucks were in almost as good as new condition but priced considerably less than new trucks, each of them killed the sale of a new machine.

"In taking trade from big firms with the idea of getting in and establishing a relation which will lead to future business with trading, the dealer is taking a very long shot. The best he can consider he is getting out of it is a fifty-fifty chance. So

many things enter into subsequent relations that he is likely to have his advantage gained by the trade-in deal more than offset by other considerations."

Remedy Awaits Strong Dealer Organization

The trade is unanimous in agreeing that there is a theoretical remedy to the evils of the second hand situation. The treasurer of one prominent dealer firm agrees with the sales end that his worst trouble is the second hand situation. The only remedy he can see is for "manufacturers and dealers to get together and not allow trading. Regarding price there is more to consider than the competition of other dealers. If a dealer takes in a truck and tries to sell it for a man and advertises it in the paper his advertisement is likely to have beside it that of some poor rascal who is broke and willing to take half it is worth for his truck in order to get the money. This helps keep prices in an unduly depressed condition." In regard to accepting trades from big firms he believes it is the worst possible way to get their business. It is better to give them a straight discount and have it over with if their business is worth having at the sacrifice of a profit.

The trade viewpoint is well expressed in the following:

"There are probably 2000 new trucks in Los Angeles. All of them are getting toward the point where they will come under the second hand market at some time; and more of them are coming on every year.

"We are offered 90 per cent. of our old cars to trade. Before we cut out trading altogether we cut out trading in all but our own. Finally we were forced to admit that after our own trucks had seen a good many years' service even they were only fit for junk. That brought us to the point where we cut out trading altogether. But we still have to handle second hands. If the trade could all get together we could avoid handling them at a loss."

Another goes a step farther. He believes:

"The remedy is a real dealer organization which will back up a rating of second hand trucks on valuation and grading according to the period in operation and physical condition, this to apply to all trucks represented by dealers with service facilities. Those not so represented would be in a grade by themselves with the valuation established on a lower basis which would give the dealer a chance to offset the higher cost of making the sale and keeping the trucks in condition to stand up while they are earning their cost."

A joint bureau of appraisal seems to be regarded as a hopeful possibility. It has been tried in Los Angeles, and failed for lack of dealer co-operation.

A strictly second hand market backed by all dealers is another suggestion.

All ideas hinge on dealer organization, complete and effective. And it is agreed that dealers must go it alone, without help, if they are ever to put it through.

A financial man who has studied the problem carefully says:

"Bankers, speaking generally, are not interested in the maker of the paper. They

look to the indorser for their money. There is no hope of discouraging dealers from unwise trading through banking pressure. Manufacturers likewise, although some of them have tried to discourage time payments, can probably not be depended upon to exercise any effective influence to prevent trading. They cannot consider the individual deal on every truck. They must look to their dealers for general responsibility, and if the dealers pay them the money and get a satisfactory volume of business they are satisfied. Dealers would resent supervision in individual sales."

The Way Out for the User

The tendency in the trade seems to be setting strongly toward leaving the second hand with the owner for disposal. But,

although the second-hand problem is growing, it need not worry the intending buyer of a new truck. Looking at it from this side, a dealer points out that:

"There is practically a total absence of certain trucks on the second hand market. This is a case of the survival of the fittest. They stand up year in and year out. Their stability and the work that they are doing give their owners no cause to displace them. I know of — and — trucks now in service which stand on the books as creditors of the firms owning them. This is because the conservative policy of charging off depreciation has been followed, the upkeep of the trucks has been carefully attended to, and their serviceable condition is practically as good as new when they have much more than paid for themselves."

An Answer to the Used-Truck Question

By WARREN EUGENE CRANE



HOW shall I dispose of the used truck problem?" That is a question that has puzzled a large number of Seattle commercial car dealers, and this article will show how the different ones have solved it. In general it will emphasize three things: 1.

The conversational style of advertising in arousing a buyer's interest. 2. The importance of putting a used car in condition before selling it. 3. The value of an accurate accounting system in obtaining statistics in reference to a machine's history.

The Barnes Beidler Motor Co., Northwest distributors of the Vim motor truck, put a used car in good mechanical condition before placing it on sale, according to Thomas Mallett, of the Sales Department. They keep two systems of prospect cards—one of regulation 3 x 5 in. index size, printed on stiff cardboard, and the other printed on larger sheets of yellow paper 4 x 6 in. in dimensions. The small white cards are spaced for the name, address, telephone, buyer, best time to be seen, and present equipment, and are divided into different piles so that the hardware dealers will be in one file, the grocers in another, and in like manner all of the different branches of business. They are given to the different salesmen who make the calls, secure the required data and place it in the proper spaces. If the prospects are favorable, the sales manager fills out the large yellow sheets, which are spaced and headed as follows: "Name, Address, Business, Interested in, Now owns, Source, See again, Remarks, Date, Telephone and Salesman." They are filed in the office and are used for a follow-up either by mail or direct solicitation. He claims that this system is of inestimable value to them in keeping accurate account of their prospects and in following them up in the quest of future business.

"In 20 per cent. of our sales of the White truck, we are forced to take used vehicles as partial payment," said E. W. Hill, manager of the Seattle factory branch

of the White Co. "This immediately brings us face to face with the problem of disposing of them. We have adopted the policy of putting every White truck in good serviceable condition before putting it on sale. We have a standing list of people in our office files who desire our used trucks. In the case of a machine not of our manufacture which we take in as partial payment, we put it in fair condition and sell it with the agreement that it may be returned and exchanged for another within a few days if it does not render good service. We find this just as satisfactory as a money back guarantee.

"Fifty per cent. of our used truck sales are for cash, while the other half is on a time payment plan, and we find that the same rule holds on new cars, though in most cases we receive a larger first payment on new cars."

The Seattle Branch makes out two reports each week, which are sent to the main office in Cleveland, giving a condensed statement of their business. One gives a report of the exchanges on a yellow sheet, with the cars received—stating the car number, from whom purchased, number of the car upon which they were applied as part payment and allowance price. It also shows the cars sold with their car number, to whom the sale was made, the selling price and the cost. In addition to this, it gives the cars on hand, the numbers of the machines, the model, style of body, color and location.

The weekly car report is made out on white paper, and is also sent to the factory; it gives the car number, the model, style of body, selling price of both car and equipment, name of purchaser, address, and cost price. In the report there is a list of the cars on hand—which gives their number, model, style of body, color and location. This is made out in duplicate so that they have a perpetual inventory of their stock, which is of great value to them.

"We overhaul, renew and rebuild, if necessary, every one of our own used trucks

The CCJ has most advertisers because it gives them biggest returns

before putting them on sale," said A. B. White, Manager of the Service Department of the Gerlinger Motor Car Co., agents for the Federal truck. "We sell them on a ninety day guarantee, and have found from our experience that this insures us satisfied customers."

The company advertises their used cars very heavily in the newspapers and aims to keep their policy of courteous treatment before the public and to put their publicity in as readable form as possible so as to attract and convince the reader. They use the Sunday newspapers almost exclusively and claim that they find it far superior to the daily paper from the standpoint of results because of the larger number of readers.

The company's used car sales are only 15 per cent. of their gross business, due to the fact that they do not believe in taking in old worn out cars as a partial payment on new trucks, though they offer to take used commercial cars on consignment and to sell them to prospective buyers.

F. F. Elliott, sales manager of the Waterhouse Sands Co., agents for the Signal truck, states that they aim to give their advertising a personal effect by writing it in a conversational style. He says that they believe in taking the prospective buyer into their confidence about the circumstances surrounding the offer of a used car for sale. If the client for whom they are trying to sell a machine is leaving the city, or is in need of money at once, they believe in stating the facts—omitting names, of course—for they believe that it gives their advertising sincerity and human interest. They put their trucks in first class mechanical condition before placing them on sale, and adjust claims as promptly and satisfactorily as possible.

The Northwest Buick Co. make it a rule to give a detailed description of their used cars in their classified advertisements; they claim that they do not believe in long lists of trucks with the names and prices of the machine. They usually head their announcements with a catch phrase like: "A word to the wise is sufficient." "Buick! Buick! Save money on this." "See it and judge for yourself." In fact, they are desirous of giving their publicity a ring of enthusiasm; there is ever present in it the mark of the dominating personality of J. G. Fenton, who writes their announcements in a crisp, readable, heart-to-heart style that brings them excellent results as proved by the 279 cars, new and used, which the company has sold in the past ten months and twenty-five days.

"We aim to give our customers a little more than they bargain for in the way of service," said Henry E. Schmidt, manager of the Northwest Branch of the Kelly-Springfield Truck Co. "We put every used truck that we place on the market in excellent condition, so that we can truthfully recommend it to prospective buyers. When a sale is made we do not consider our work done, for we strive in every way to make the buyer familiar with the workings of his truck, and to impress him with the fact that we are interested in his welfare

so that he will buy of us again if his business warrants a larger commercial car to fulfill the demands made upon it."

Geo. W. Miller states that he buys used trucks which no one else will buy, and takes them to pieces and sells the parts that are in a salable condition. He says that he doubles his money in this way, and maintains that this is more satisfactory than trying to sell the machine after it is completely worn out. He is selling these parts by mail order to people in Washington, Alaska, British Columbia, Oregon, Idaho and Montana, and finds that his used parts

catalog brings more profit to him than his sale of cars.

After a careful investigation of the motor truck dealers' business methods, one comes to the following conclusion: The most successful firms in this field of endeavor are the ones who put their used cars in good condition before selling them and advertise them attractively and consistently. They believe that there is something far more important than the mere sale of any individual truck—namely: an ideal of service which is essential to the upbuilding of any progressive business.

Buffalo Dealers Discuss the Second-Hand Problem

By GEO. W. GRUPP



SECOND HAND motor trucks are bugbears to Buffalo truck dealers. The problem of marketing them or taking them as part payment is a "damnable proposition," as one dealer put it. Truly it must be such when one stops for a moment to think. The dealers have a real grievance. More than once have they been "stung," or lost a prospect because his first truck happened to be a used one. However, by dogged persistence and with the many experiences of having allowed money to be beginning to wake up and learn a get away from them, the Buffalo dealers few points about used trucks.

E. B. Olmsted

Each dealer seems to have his own peculiar notions about the selling of used trucks. E. B. Olmsted, agent for the Diamond, said in part: "I find that the best medium through which one should advertise a used truck is in the daily newspaper. It is not a display advertisement that gets the best results, but rather the 'want ad.' More people will read a 'want ad' column than a display advertisement. This kind of advertising not only helps one to market his used trucks, but it actually swells one's list of prospects."

"But before one should attempt to advertise in the newspaper columns," he continued, "a dealer should give the truck a thorough overhauling and paint it up so that it will look like a new one. Remember, appearances go a long way in making a sale. It's the first impression that acts as a clincher. A nicely painted used truck pleases a prospect, but a shabby looking affair scares him. The truck should be thoroughly overhauled, because thus a dealer offsets any future 'comeback' and thus enables him to sell him a new truck some time in the future."

"Then there is another method I use in marketing a used truck. Sometimes a man will come into my place and ask to see a truck. Of course I am always glad to show a prospect a truck. He in turn is usually pleased with my truck. Then he asks the price. I tell him. 'Nothing doing,' he will say, 'I intend to invest only so much in my first truck, as I consider this

truck proposition an experiment.' Under such conditions, as is often the case, the only thing to do is to sell him a second hand truck if you happen to have one on hand."

"Again, I always try to keep my eyes and ears open. It is not infrequent that one hears of a farmer or someone like that who is looking for a man with a truck to do his hauling for him into the city. Once I learn this fact, the first thing I do is to get a prospect and then introduce him to the trucking business by placing a contract in his hand, provided he buys used or new truck from me. This I have tried with success a number of times."

"But after having said all of the foregoing one might think that I like the second hand game. I like it in so far as I don't have to take a used truck as part payment toward a new one. I prefer to have the privilege of selling it on a 10 per cent. basis. In other words I prefer to have the truck sold before making delivery of the new one."

Louis G. Schoepflin

Louis G. Schoepflin, the Bison City agent for the Globe and other motor trucks, said: "In taking an old truck as part payment I place the allowance so low that I can either sell it as junk or thoroughly overhaul it. If you don't overhaul it thoroughly then there is going to be trouble in your camp. The new owner is going to strain the truck where it was never strained before. If he breaks down with it, then it is good-bye motor truck, motor truck idea and your reputation."

Borst-Damon Company, Inc.

Harry M. Damon, of the Borst-Damon Co., Inc., agents for the Republic and other motor trucks, said: "We will not take a used truck as part payment unless the truck is sold before we make delivery of the new one. It is our policy when we agree to market a second hand truck for our prospective new truck buyer to get the market price so low that we can easily dispose of it."

"And as we are talking about this proposition an idea crosses my mind. I wish this was possible, but I fear the dealers

(Continued on Page 33.)

Steps Taken to Enlarge Scope of Society of Automobile Engineers

Officers Nominated for Coming Year



DURING the midsummer outing of the Society of Automobile Engineers, June 12 to 16, on the S. S. Noronic, a movement was set on foot to change the name of the society from the Society of Automobile Engineers to the Society of Automotive Engineers. The purpose of this change is to make the title of the society designate more correctly, if possible, the work of the organization in its enlarged field, which it is hoped it will occupy after the January meeting.

For some time there has been a feeling that there was much duplication of work, especially on engines in the marine, aeronautical, tractor and automobile fields, and that the S. A. E., with its well-organized standardization work, is in a position to amalgamate with the marine, aeronautical and tractor interests and carry on without duplication this work with an enlarged standardization committee.

During the progress of the sessions, a suggested amendment was placed before the meeting by E. S. Foljambe, proposing the above change in the name and changing the Governing Council as follows: That the Council shall consist of 15, which will include the president, the first vice-president and five second vice-presidents, representing motor car, aviation, tractor, marine and stationary internal combustion engineering, respectively, six councillors, the treasurer and the surviving past president who last held office. Succession to office will be in the usual manner, the vice-president taking the place of the president, and in case of the vice-presidency becoming vacant, the Council is to elect a successor from the second vice-presidents.

This move has been discussed in the Council and advocated by several prominent members of the S. A. E., such as President Huff, Past Presidents Coffin and Henry Souther and others, as it will greatly facilitate standardization of all these fields and therefore the work of general preparedness. The matter, as usual with amendments to the constitution, will be placed before the members of the society by mail and will be acted upon at the annual meeting in January.

Nominating Committee's Recommendations for 1917

For president, George W. Dunham, consulting engineer, Detroit; first vice-president, J. G. Vincent, vice-president of engineering of Packard Motor Car Co.; second vice-president, Charles M. Manly, engineer Curtis Aeroplane Co.; treasurer, Herbert Chase, chief engineer of Automobile Club of America testing laboratory; for councillors for two years, H. L. Horning, engineer and general manager of the Waukesha Motor Co.; B. B. Bachman, engineer of the Autocar Co., Ardmore; C.

W. McKinley, chief engineer of the Willys-Overland Co., Toledo, O., and for one year, F. E. Moskovics, commercial manager of Nordyke & Marmon Co. This slate will be voted upon by mail, the new officers to take their places at the close of the January meeting.

Standards Committee Work

The various chairmen of divisions of the Standards Committee made their reports and same will be submitted to mail vote of the society and those adopted will then be published. The various committees that reported are as follows:

Reports of Standards Committees

Standards Accepted for Mail Vote.

Report of Ball and Roller Bearings Division: Suggested standard interchangeable sizes.

Carburetor Fittings Division, including recommendations concerning flexible tubing.

Report of Chain Division.

Electrical Equipment Division, including standard dimensions for lamp brackets.

Report of Electric Vehicle Division: Charging plug receptacles.

Progress report of Engine and Transmission Division.

Progress report of Foreign Co-operation Division. (Foreign engineers too busy with war to co-operate much.)

Iron and Steel Division: New high carbon nickel steel. Test specimens.

Miscellaneous Division: Standard piston ring grooves. Bolts threaded $\frac{1}{4}$ in. further.

Nomenclature.

Progress report Research Division.

Tire and Rim Division.

Truck Standards Division reorganized. Attempting to standardize controls.

The sessions on the boat were very successful, the attendance was large, there being approximately 550 in the party. The trip was carried out as per schedule, with the exception of the stop at Owen Sound, which was dispensed with owing to a heavy fog, which delayed the vessel during the night.

A number of the professional papers, which pertained to truck interests, we published in our last issue and following are extracts of several other papers which should be of interest to the commercial car industry.

KEROSENE VERSUS GASOLINE IN STANDARD AUTOMOBILE ENGINES

By CHARLES E. LUCKE

Cause of High Fuel Prices

Automobile designers, manufacturers and users have become accustomed to the idea that gasoline is the one proper and necessary fuel, and have consistently demanded it, rejecting everything else.

The procedure of the refineries in developing new and higher gasoline-yielding methods is highly proper. The contributions of the oil chemists that have made it possible are most gratifying to all scientific men, but the results cannot be regarded as a satisfactory solution of the problem of cheap automobile fuel.

The oil man's interests are not served by the production of a cheap automobile fuel; he must have a satisfactory profit on a barrel of crude from the sale of all the products derived from it, and it matters little to him whether the average selling price is the result of a small yield of gasoline at high price with a large yield of heavier products at a lower price, as with the old standard cheap distillation processes; or of a more or less complete conversion of heavy products so that all salable material is gasoline at an intermediate price. As a matter of fact the best results all around are served not by additional refining costs such as the new cracking processes require, but by the use of the cheapest available refining methods, and the fullest possible use of all the products of that refining, the chief of which is kerosene.

Why Cracking Processes Are Unsatisfactory

Development of satisfactory means of utilizing kerosene by automobile engineers will entirely change the situation from every standpoint, and produce results entirely satisfactory to everybody, which is impossible

by any other procedure. The new cracking processes do not constitute a satisfactory solution for three principal reasons: (a) Kerosene cannot be removed from the market because it is an old commodity and the most perfectly distributed oil product in the world's markets; (b) the cost of installing new plants involves millions of dollars, which must be paid for by the new product, assuming that the refiner can command the capital in the first place; (c) all of the new cracking processes are patented and patent rights certainly will not be made available to everybody.

Kerosene-utilizing appliances are more worthy of development than are the new oil cracking processes. Their perfection will constitute a more true and sound solution of the present automobile fuel price difficulty for the following leading reasons: (a) kerosene is now available in much larger quantities than gasoline, and no new refinery capital or patent rights are needed; (b) it is now sold at a much lower price, ranging from one-half to one-quarter; (c) it is on sale in more places many times over, distributed throughout the world, including its wild places; (d) its use will, while increasing its price a little, also lower gasoline prices more, permitting the production of the latter in more refined grades for special purposes, resulting in a stabilizing of the prices in proportion as relative use corresponds to natural yield in cheaply operated standard stills.

The oil men are not only willing but anxious to co-operate in the development of the kerosene automobile. The Independent Oil Men's Association appointed a committee,

charged with this duty, only two months ago, as a result of the presentation by the writer of a paper before them, setting forth the possibility of success and the need for organization to perfect and bring into use such appliances. The kerosene automobile is not only a possibility but almost a reality, a reality now in the experimental sense, to become generally accepted and widely used just as soon as produced in sufficient quantities, mainly for new construction, but partly by old gasoline car conversion. The intermediate step is one of mechanical perfection of the kerosene-utilizing appliances with the least possible change in the rest of the engine and accessory parts, and it is this step that must be undertaken by the automobile engineers to warrant the support of the oil and the automobile manufacturing interests.

Kerosene Cannot Be Used in Gasoline Equipment

Use of kerosene in standard gasoline equipment does not produce what can be regarded as satisfactory results from the operating standpoint because even in addition to the requirement of gasoline for starting purposes, the kerosene is so little vaporized as to involve troubles of the following well-known order: (a) Bad header distribution between carburetor and the several intakes, resulting in unequal charges to the several cylinders; (b) excessive washing down of lubricating oil from the cylinder walls, due to its solubility in kerosene—proved by the accumulation of kerosene in the crankcase oil; (c) smoke and smell in the exhaust, or internal carbon, due to decomposition of heavy unvaporized kerosene drops and wall films, or late vaporizing oil unmixed with air, by the explosion heat of the mixed part; (d) misfires and backfires, due to variations in the mixture as a result of varying degrees of vaporization of the oil that passes the carburetor as the engine temperature varies—especially noticeable with changes of throttle, engine speed or load.

The trouble encountered can be generalized as due to excessively wet mixtures, or, inversely stated, to incomplete vaporization and even to mixtures of a variable degree of vaporization.

Mixture Conditions Classified

Three mixture conditions are given the following names for the want of better ones: First, rain; second, fog; third, dry. The first of these is a wet rainlike mixture, hardly a mixture at all, in which much of the fuel is not only vaporized but exists in the form of heavy raindrops, or streamlike films on the side walls of the passages. The second or fog condition is one in which much, if not most, of the oil is in the unvaporized state, but in drops so fine as to appear like tobacco smoke. These remain suspended in the air for a long time, as do the clouds in the atmosphere or moisture in steam, but are equally subject to the collection and precipitation or separation as rain or wall films. The fog that has not precipitated as rain or wall film is reasonably well distributed through the air, making a true mixture as distinguished from the first or rain variety. The fuel is in the liquid rather than in the vapor state, so much mixture can be quite cold as is also the case with the rainy mixture.

Dry mixtures, the third class, are perfectly clear and transparent, true invisible vapor and air being as thoroughly mixed, and as stable, as a gas and air mixture and as hot as the fuel properties require for the vapor state of so much fuel as is present with the air. Such mixtures are subject to no pipe or wall deposits, so long as the walls are

warmer than the mixture, or the mixture sufficiently superheated above the dew point.

Flow of Wet Mixture as Seen Through Glass Tubes

Wet mixtures, whether in the rainy or the fog condition, will, as they pass through the intake or manifold, produce a wall film of liquid, which flows in a way different from the air, the vapor or the fine fog, the difference being responsible for bad distribution to the branches. Such a wall film always moves more slowly than the gaseous stream and only moves at all because of friction between the liquid films and the true mixture; it distributes circumferentially around a passage in an unequal way whenever, as is always the case, the center stream itself is moving irregularly. For example, at a damper or butterfly throttle-valve the mixture is divided into two high velocity streams, moving most rapidly along two lines at opposite ends of a pipe diameter at right angles to the throttle spindle. The liquid is thus forced around the circumference to the points where the vapor velocity is least, that is, in line with the spindle. Sighting through a glass tube the two streams of liquid would be visible, separated by two dry streaks. At an elbow the liquid can be seen in a glass tube to collect on the inside of the bend where the mixture velocity is least, and at a branch the liquid will pass from side to side of the feeder and branches as mixture velocity or flow direction changes, never dividing equally because of the time lag in the changes.

A decrease of mixture flow velocity causes greater accumulation of liquid, but a sudden increase tends to lift off the accumulation from the walls, drawing it through the engine with the effect of momentarily great excess of fuel, which may cause misfire and the action known as "choking." Again, such a film tends to produce a similar enriching effect whenever the throttle is closed suddenly, especially if it is somewhat warm, because of the sudden and great reduction of pressure, which can exceed 25 in. of mercury vacuum, and produce a sudden vaporization of the liquid film. Such conditions constitute the first objection to wet mixtures, especially to the rainy form, and to some, although to much less extent, to the fog form.

Single-cylinder engines suffer but little from these rainy mixtures because the whole product passes through one valve, and only the throttle movement producing film vaporization on closure, and liquid lifting on opening remains. The mingled streams of mixture and liquid will partly vaporize and partly be sprayed on passing through the inlet valve. If the interior walls are hot enough, the liquid that strikes will be largely evaporated, while that remaining suspended from the inlet valve spraying will vaporize on compression. Cold, wet, rainy mixtures can therefore be used in such single-cylinder engines with fair success, or in multiple-cylinder engines fitted with a separate carburetor for each cylinder, if the combustion chamber walls are kept hot enough; this is the method in use in the standard farm tractor engines such as the Hart-Parr, International Harvester and Rumely. Of course, the mixture is not quite homogeneous, nor is it feasible to keep the walls hot enough, so some smoke may be expected at times and some lubricating oil solution or weeping, both being reduced as the walls become hot.

In order to carry sufficient compression to secure high mean effective pressures and thermal efficiency, or avoid the reduction of those accepted as standard for gasoline, water injection is resorted to and is successful. Its effect is three-fold; first, to pre-

vent the mixture in the cylinder reaching its ignition temperature too soon, by reason of the mixture cooling incidental to water evaporation during compression; second, to slightly raise the ignition temperature by the neutral steam dilution, also by such dilution to reduce the rate of propagation and produce a slow combustion instead of a detonating shock, and third, by water gas reaction of steam with nascent glowing free carbon in process of combustion in regions where the air is insufficient, to keep the interior clean.

Multi-cylinder automobile engines cannot use water injection, nor is it feasible to equip each cylinder with its own carburetor, though both of these things might be done if there were no other way; so it can be said that the rainy, wet mixture is not only unsuited to the automobile engine, but so also is the standard tractor engine modification of hot breech-end, with water injection and individual fuel supplies.

Advantages of Fog Mixtures

Fog mixtures are less difficult to handle than the rainy variety, but require some special means for their production. They exist at temperatures even lower than those of the present normal gasoline mixtures and can therefore be compressed as high or higher than gasoline as now used, with a correspondingly high mean effective pressure and large power output, and without water injection.

The apparatus for its production, however, while working well, seems to be unsuited for automobile use because of its bulk and the considerable time required for starting.

Dry mixtures have so many advantages and so few disadvantages as to warrant the belief that it is along these lines that effort can be concentrated with prospects not only for immediate success, but for success of a kind that will be followed by widespread general adoption of dry mixture apparatus. Such mixtures can be supplied to any number of cylinders through a straight header pipe with right-angled branches, and each cylinder will receive exactly the same charge as every other, regardless of load, speed or throttle, and without any special bulky manifold construction. In burning, the combustion is complete and perfect, assuming, of course, that a good carburetor is used to control the proportions of air to oil and keep the ratio constant. Smoke and carbon deposits are eliminated and so also is cylinder weeping. Such mixtures are hot, necessarily as hot as the fuel vapor pressure requires and therefore the compression must be reduced, reducing horsepower and efficiency correspondingly, but not to a serious degree. As everything depends on the temperature required, it is necessary to investigate this through the properties of the fuel and those of the mixture of vapor and fuel in combining proportions.

Relation of Vapor Pressure and of Temperatures

Reference to a vapor pressure curve, that of ethyl alcohol, for example, shows that at latter the contracting walls of a straight temperature of 72 deg. Fahr. is necessary to develop the vapor pressure of 49 mm. Hg. required for dryness in the air mixture of combining proportions, and similar reference to the curve for hexane, which requires 16.2 mm. Hg. vapor pressure, shows that the temperature required is zero deg. Fahr. approximately. At any higher temperature than these the mixtures would be superheated or the humidity less than 100 percent., and condensation would be more remote. As the saturated condition is approached, the evaporation becomes more

(Continued on page 42)

The CCJ is the only truck publication a member of the Audit Bureau of Circulations. There's a reason!

Second-Hand Car Problem in New York

By C. P. SHATTUCK



NEW YORK dealers are divided in opinion as well as in practice as to the best methods for solving the problem of successfully and advantageously dealing with the second hand or traded in truck. Some claim, particularly the larger dealer and factory representative, that the only logical and practical solution is not to consider any car as part payment. Others hold views that are diametrically opposed, believing that trade ins are legitimate when handled honestly. They maintain that experience has taught them that there is a market for the used truck on account of its price and that the purchasers ultimately buy new trucks.

That the second hand commercial car is a factor in a competition that is harmful to the industry, is the opinion of practically every dealer visited by the representative of the COMMERCIAL CAR JOURNAL who called upon the majority of the dealers including representatives of all types of commercial cars. It was claimed that some dealers are indulging in what is termed concealed price cutting; that is, allowing considerably more for the traded-in truck than its real market value, and it was also stated that these discounts often assume large proportions. One large dealer stated that the failure of some dealers to make a success in marketing commercial cars is due to this concealed price cutting, which is not always intentional, but sometimes due to a lack of judgment in appraising the car to be traded in or the cost of placing it in a marketable condition. While dealers of this class are, as a rule, short lived in New York where the overhead expense cost of service, etc., does not permit of sharing commissions with the purchaser other than those provided by the legitimate sliding scale, their methods create false impressions that are handicaps to those who succeed in the agency.

While the problem of the second hand truck is at present solved individually, and as previously pointed out there are varying opinions as to the best method, the plan suggested by a large dealer and which is described in detail elsewhere in this issue, appears logical and practical. It includes a remedy for concealed price cutting as well as provides for a profitable disposition of the trucks traded in. One of the advantages claimed of the plan is that it would relieve the dealer of any responsibility insofar as the sale of the truck is concerned.

J. B. Cowen, vice-president and general manager of the R. E. Taylor Corp., 427 West 42d St., New York City, eastern distributors of the Garford line of commercial vehicles, believes that trade ins are legitimate products of the industry when handled honestly. He divides purchases into two classes, one buying the new truck and the other the second hand car because

of its price. Mr. Cowen stated that a form of competition existed among some dealers who took advantage of trade ins by creating an opportunity for price cutting. These dealers would buy a trade in at a much higher value than the truck's real value, although dealers of this class will not admit it. "The dealer who allows a man for his traded in truck a value in excess of its real market value not only gives an unadmitted discount of sometimes large proportions,

but he cannot succeed in business," stated Mr. Cowen. "The only discounts or commissions that are legitimate are those given to buyers in quantity as provided by our sliding scale. Price cutting in the form of trade ins should be discouraged if the best interests of the truck industry are to be served."

The methods employed by the R. E. Taylor Corp. for dealing with the second hand truck proposition are best described by

ORIGINAL—SERVICE STATION COPY. FROM R. E. TAYLOR CORPORATION		
Date:	To: GARFORD MOTOR TRUCK COMPANY, Inc. SERVICE DEPARTMENT	
Contract No.	File No.	JOB ORDER N^o 1472
Refer to previous Job Orders, Nos.		
Deliver to:		
For Account of:		
CHECK UP THE FOLLOWING ITEMS CAREFULLY BEFORE DELIVERY:	EQUIPMENT: <i>Items checked with an "X" to be supplied:</i>	DRIVER TO BE FURNISHED BY
Make:	Two Head Lights:	For Days,
Model:	One Tail Lamp:	at expense of
New or Second Hand:	One Searchlight:	
Truck or Car:	One Horn:	Truck or Car Delivered by
Tag No.	Complete Set of Serviceable Tools	
Chassis No.	Jack and Handle:	Date:
Capacity:	Tire Pump:	Truck or Car Inspected and found O. K.
Wheelbase:		
Make of Tires:		
Size of Front:		
Size of Rear:		
Style of Body:		
Extra:		
Following to be filled in by Inspector before truck or car leaves building:		
Oil filled:	Grease Cups filled:	Gas. Tank filled:
Radiator filled:	Motor tuned:	Brakes adjusted:
DELIVERY:		
SPECIAL INSTRUCTIONS:		
CHASSIS:		
BODY:		
PARTS:		
EXTRAS:		
TAKEN IN TRADE	O. K'D BY _____	
CHARGE TO	Job Order _____	
RELEASE No.:	N^o 1472	
DELIVERED:		

Form Used to Keep Track of Traded-In Car

The original of the five form sheets employed for keeping track of the traded-in car. These sheets are also utilized with new trucks, and both types of machines are given a serial number

The CCJ has most readers because it gives most information

the system utilized and its principles can be applied by the smaller dealer with equal success. Among its several features of merit is that of keeping track of the costs of the traded in truck, and these records are instantly available to salesmen, heads of the various departments and officers of the company. It is possible for the financial man of the company to ascertain very quickly the amount of capital invested in traded in cars as well as to note the per cent. loss or profit on any second hand machine sold. The system is such that any errors in appraisals, delays in the work, etc., can be instantly detected.

Upon a salesman coming in contact with a prospect who desires to trade in a truck as part payment the former makes out a report card which is given to the appraiser, and the salesman is not allowed to even give the prospect an approximate price. There are no delays in making appraisals and R. J. Willoughby who has charge of this work as well as general supervision over the service department, is not only an expert machinist, but his experience with automobiles dates back to the period when a motor car was a novelty.

The result of the inspection is entered on what is termed the appraisal card and the details of the report include the make of the truck, model, year, capacity, chassis number, style of body, general appearance and condition. Details are given of the condition of the power plant, transmission, rear axle,

prospect, but he is not allowed to exceed the appraised figure which is final. By this is meant that there is no splitting any differences that may exist between the appraised price and the amount asked by the prospect. After the sale or trade is made a series of duplicate form sheets is made out and the system is also utilized with new trucks.

There are five of these form sheets, each bearing the same serial number. The original is the service station copy and is white. The second is blue, and goes to the contract department where it is filed. The third sheet is yellow and is for the accounting department, while the fourth is pink and is sent to the repair shop. The fifth copy is plain white and is retained by the appraiser. The time of receipt of a copy or a sheet is indicated by a time stamp and that utilized by the appraiser has his initials. The instructions, records, data, etc., relating to the truck including the equipment, time to be delivered, etc., are similar on every sheet as carbon paper is inserted between each sheet when the data is typewritten.

If repairs are to be made; that is, the truck placed in first class condition as well as painted, the instructions are written on the sheets. Upon the receipt of the repair shop copy the foreman turns it over to the time clerk, who makes out a job card and a carbon copy of the instruction is given to a workman. If new parts be required the requisition for same must bear the num-

It should be explained that traded in trucks appraised at below a given figure are sold "as is." The rule relative to the conduct of salesmen selling these or the overhauled cars is strictly enforced. It compels the salesman to describe the car just as it is and as he has accurate data supplied by the appraiser, he cannot other than knowingly misrepresent the condition of the car. This is the policy of the company which disposes of as much as \$40,000 worth of second-hand commercial cars during a year. Mr. Cowen has developed one of his live wires into an efficient salesman of second hand trucks, and the manner in which he depletes the stock demonstrates the sound selling policy practiced by the company.

Requires Many Men for Overhauling

To place the traded in trucks in first class or an operating condition requires a large number of employees, particularly when it is taken into consideration that all types of machines and those of varying capacity are received as part payment for new. It is, as a rule, possible for the R. E. Taylor Corp. to meet any individual requirement, be it a small delivery car or a truck fitted with an automatic dumping body having a capacity of 4-3 cu. yds. As a rule all traded in trucks are painted, the company maintaining a paint department which includes two men who do nothing else but clean the chassis and bodies. This is the first step in the work of preparing the traded in truck for a sale, whether it be a car that is to be thoroughly overhauled or one that is to be sold as is.

One entire floor of the building is given over to the repair shop and a part of another floor is sometimes used to take care of the overflow. There are 17 expert repairmen, including two helpers, and every repairman must be an expert machinist to obtain employment with the company. He must be capable of turning a bushing as well as grinding or lapping a crankshaft. The men are divided into what may be termed specialists of the different components of the chassis. Some do nothing except engine work while others overhaul clutches. Another group are experts on transmissions and still another handle the rear ends. In this way more rapid progress is made. In addition to the day men there is a force of night repairmen, but if a day man starts upon a certain job such as overhauling a gearset, for example, the night man does not touch the work. In this way any faulty labor can be easily traced and the workman held responsible. In addition to the repair shop which, of course, includes a thoroughly equipped and modern machine shop, there is the wood working and upholstery departments. In the last named is repaired, worn and torn seats, cushions, etc., and it is not an uncommon thing to newly upholster a traded in truck. This department also builds new curtains as well as makes repairs. The blacksmith shop is located on the roof and the two men employed are proficient in all types of forging, spring repairing, etc.

The system provides means for keeping an accurate record of the time spent on

MAKE OF TRUCK			NAME OF PROSPECT		
YEAR	TONNAGE	CHASSIS NUMBER	ADDRESS		
STYLE OF BODY					
GENERAL APPEARANCE AND CONDITION					
MOTOR CONDITION	TRANSMISSION	REAR END	TIRES %		APPRAISAL FIGURE
PRESENT CONDITION			FRONT	REAR	
APPROXIMATE COST TO PUT IN SELLING SHAPE					MARKET SALES PRICE
SALESMAN _____			APPRAISER _____		
TERRITORY _____			DATED _____ 191		
REPORTED ON No. _____					

Appraiser's Card or Report on Truck That is Contemplated in Trade

The card is placed in an indexed cabinet in the sales manager's office, where it is available to the salesmen

tires, etc., and the market value as is. The estimated cost of placing the engine, transmission, etc., in serviceable condition is given on the slip, also the market sales price with these or other needed repairs completed. The data includes the name and address of the prospect, that of the salesman, his territory, and the signature of the appraiser and dates. These cards are filed in an indexed cabinet in Mr. Cowen's office and are instantly available to all. The salesman then endeavors to close with the

ber of the job, and the o. k. of the foreman, and this applies to both parts carried in stock, such as for Garford trucks or other makes that have been taken in the trade. A copy of the requisition is sent to the accounting department as is the shop copy of the form previously described. These sheets must tally and it is not possible for any part or material to remain uncharged to some department as the omission would be instantly detected by the accounting department.

The CCJ has most advertisers because it gives them biggest returns

any job or piece of work as well as that put in by the employees of the different departments. A Cincinnati time recorder is employed, but the workmen are not allowed to stamp their time or that utilized on any piece of work. Upon a workman arriving or departing he takes his card from the rack and hands it to the clerk, who stamps the time. The same method is employed on jobs. As the company pays its employees good wages it believes that it is entitled to as many hours as the men contract to work. An advantage of having the clerk stamp the cards is that a workman cannot stamp a fellow employee's card to prevent discovery of the latter's lateness in reporting to work.

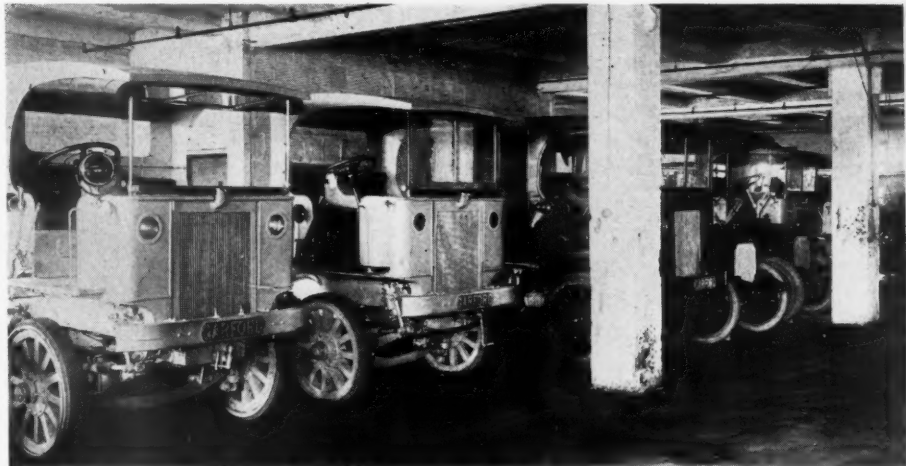
The extent of an overhaul depends largely upon the market value of the traded in machine. In some instances it warrants the replacing of all worn components and at the same time the writer visited the shop one burned machine that had been taken in, a Garford, was being practically rebuilt. In another case the cylinders of an engine had been rebored and new pistons and rings fitted. All engines overhauled are subject to a running test of several hours under their own power. Upon the work being completed the truck is tried out on the road and if it meets with the approval of the appraiser he o. k.'s a report.

During the work of renovating a traded in truck it is possible for the accounting department as well as the heads of the service or repair shop and the appraiser to keep track of the progress of the work. Any delays are investigated and the fault located, and this applies particularly to new trucks that have been sold and are to receive a special type of body or equipment. The heads of the departments are held responsible and as each is supplied with a duplicate copy of the orders and these are numbered, it is a simple matter to locate any given piece of work.

The costs of all work and expense incurred with a second hand truck is entered in what is termed the cost book in the accounting department, and the totals being added daily, it is possible to note instantly what the truck is costing from day to day. If the machine is sent out on a demonstra-

tion by request of a salesman the driver's time, fuel and oil is charged against the car. If the demonstration is paid for by the prospect, as is sometimes done when the machine is used in certain transportation, the sum is credited. Every truck is given a number, the second hand having a serial beginning say at 10,000 and the new machines at 1. When a car is sold the number is transferred to another card. The index is so arranged that it shows the time of sale, price, purchaser, etc., at a glance,

merce lines, does not believe in accepting in trade trucks other than those he represents. The policy of the company is to sell the traded in car as is when in a serviceable condition and to endeavor to place it before the trade is consummated. When conditions warrant it a car is overhauled. No premiums or discounts are given and only the market value of the trade in is allowed. No difficulty is experienced in disposing of the cars taken in trade, but Mr. Case, like other New York dealers, deprecates existing



Some of the Traded-In Trucks

After going through a thorough overhauling and painting they compare very favorably with new machines

and the system includes means for keeping track of the uncompleted work. The cost book is of particular interest to both the appraiser and the head of the accounting department, secretary William B. Wilson. The former is interested to know if his appraisals are correct, while the latter is concerned with the costs, particularly when the machine is sold at a loss, which occurs under certain conditions in which the human element is not a factor. By this is meant that an appraiser is not always infallible.

C. F. Case, vice-president and general manager of the Morton W. Smith Co., Inc., 136 West Fifty-second street, New York City, successors to the Federal Motor Truck Co., representing the Federal and Com-

conditions relative to those dealers who not only the market value of the trade in is only indulge in concealed price cutting, but make representations that are suicidal if adhered to. One agent is credited with giving a five-year bond or guarantee and agrees to take the truck in trade within a certain length of time, allowing 80 per cent. of its retail value.

Dealers' Co-operation Needed

Mr. Case suggests a plan which he believes would solve the used truck problem. It would require the co-operation of the majority of the dealers and factory representatives and consists of forming an organization which will select an honest and competent representative who will appraise second hand commercial cars. Bulletins are to be issued at regular intervals, giving the market price of the different models, and the dealers are to be guided in their trades by the prices.

"In this way," said Mr. Case, "there would be a regular or fixed price for a car. If a prospect desired to trade in a car for a Federal, for example, I could refer to my bulletin and noted what the used car of that model is quoted at; that is, what the representative of the association would allow for it. If the prospect was dissatisfied, as is frequently the case, and tried to obtain a better value from another member of the association, this member would quote him the same price as I did. The prospect might try several dealers, but after receiving the same appraisal would be convinced that I had allowed him full value, and it is but natural to assume that as he first called upon me he had practically decided upon my car.



A Section of the Garford Repair Shop

This is utilized for overhauling traded-in cars and employs a day and night force

The CCJ leads in circulation, advertising and prestige

"The plan of having the members of the association recognize some responsible and thoroughly reputable second-hand dealer and accepting his valuations as final is not a new plan, but its principles could be applied to the used truck problem. It has been tried with success with the pleasure car and a certain company in a large western city not only establishes the market values of all makes but also gives a cash price to dealers. This plan is worthy of consideration, as it not only relieves the dealer of the expense of selling the traded in machine but of the responsibility of its sale. There is another angle. It would, I believe, remedy many of the evils of concealed price cutting as well as be of value to the small dealer whose limited capital does not permit him to carry a stock of traded in trucks, to say nothing of the expense incurred in turning them into cash.

"Personally, I believe that the plan could be successfully carried out if the dealers in New York would get together. I am willing to co-operate with any one or a few dealers in starting such a movement, and while I admit there will be a number of objections to be overcome as well as details to arrange, I am confident that the best interests of the dealers in New York would be served by the adoption of this or a similar plan."

Mr. Case was assistant manager of a company in Detroit handling second hand pleasure cars on the plan above outlined. He stated that not only was the plan beneficial to the trade, but the company cleared an annual profit of five figures.

Will Not Consider Used Trucks

Robert C. Reid, truck sales manager of the Harrolds Motor Car Co., representing the Pierce-Arrow line in New York City, will not consider any used truck nor does he deem it necessary to aid the prospect in disposing of his car. "The most common method employed by prospects for cutting the price is to force an old truck on the dealer," said Mr. Reid. "Why this is tolerated is beyond my comprehension. It has resulted in ruin in hundreds of instances. If manufacturers will co-operate they can eliminate absolutely all trading in except their own makes. There is no reason why

we should encourage the belief of the buyer that our position is so weak that we must dispose of his old trucks for him. As a rule such methods result in unsatisfactory customers."

Mr. Reid stated that the large buyers are the greatest offenders and that in some instances they have been almost dictatorial in their dealings. He is of the opinion that every old truck sold by a dealer prejudices some one against the dealer. Neither does Mr. Reid believe that an old truck can be disposed of by truthful statements as to its condition, etc. "Avoid the man who considers price only," said Mr. Reid. "We have never taken a truck in trade nor have obligated ourselves to assist our customers in disposing of their old ones. No discount is allowed except that based on the sliding scale advocated by the factory. It will be for the advantage of every dealer to follow our example, and I believe that it can be proven that our profits per truck averages as high as any other dealer."

Cars Accepted Only at Market Value

E. F. Miltenberger, President of the Manhattan Motors Corp., which concern handles the Vim delivery car and Selden line of trucks in New York and vicinity, accepts heavy cars in trade, but at their market value. The appraiser of the company is held responsible for his valuations, estimate of needed repairs, etc. Mr. Miltenberger holds decided views as to the dealer who cuts prices by placing higher than market value on the used truck. "Either the price cutter or the purchaser loses," said Mr. Miltenberger. "The latter cannot expect quality or service if the dealer can afford to make liberal concessions on trade ins."

No trucks other than their own are taken in trade by the Packard Motor Car Co., of New York, and these are taken at their actual worth. Some machines are sold as is, but those that are overhauled are sold with a guarantee. No discounts of any kind are given other than the sliding scale permitted by the factory. E. S. Hare, supervisor of the truck and pleasure car departments, says that 75 per cent. of the concerns making a failure in the marketing of commercial vehicles is due to accept-

ing used trucks as part payment and allowing more than their actual or market value.

S. De B. Kim, New York manager of the Locomobile Co. of America, stated that the policy of the company is not to make any trades whatsoever. "We could not afford to market our trucks at their present price if we accepted used vehicles as part payment."

Mr. Poertner, of the Poertner Motor Car Co., who directs the sales of the Jeffery Quad in New York City and vicinity, will not consider any proposition that includes the trading in of a used commercial car. "And it is not possible for seekers of discounts to obtain the Jeffery from dealers elsewhere. We maintain prices."

R. T. Alcutt, manager of the Knox Motor Associates' New York branch, says that the policy of the company is to strictly maintain its published prices. Like other concerns a sliding scale is employed. Used cars are sometimes taken in trade, but mostly Knox machines. These are placed in a good operating condition before being sold. Mr. Alcutt advocates the forming of an association to prevent price cutting but is of the opinion that it would be exceedingly difficult to work out a successful plan.

T. W. Garland, of the Garland Automobile Co., New York City, will not take in used trucks in part payment for Velies. Discounts or commissions are not allowed other than those permitted by the factory. He believes that if a dealer sells a truck that is suited to the work and gives satisfaction that he has fulfilled his part of the contract, particularly when the dealer represents a reputable manufacturer and affords first class service.

"I'm too busy to fool with road or to vote fer 'em or anything uv th' sort." is a remark you sometimes hear. Isn't it enough to cause every tarnation back hair to stand on end? A man might as well say he's too busy to feed his stock. That big strip of smooth ground, running, like a ribbon, past his place, helps feed th' universe."



Armored Motor Trucks of the First Battery, National Guard, N. Y., Off for Peekskill, N. Y.



Naval Reserves, in Truck, on Recruiting Cruise Through New York City

The CCJ brings greatest returns to advertisers because of largest circulation among quantity buyers

The Sterling Road Oiler in Service of the City of Milwaukee

A road oiler has recently been placed in service by the Milwaukee municipal authorities, same being mounted on a Sterling 5-ton worm drive chassis and is interchangeable with the 5-ton dump body and hoist. The feature of this oiler, which is of pressure type, is its simplicity of construction. The superstructure has been relieved as much as possible of the usual mass of piping, valves, gages, unions, etc., thereby being in keeping with the maker's ideals of building for commercial as well as municipal service the simplest possible machinery.

The oil tank, of 1200 gal. capacity, is made of 3-16 in. sheet steel, fitted with a series of splash plates. The tank, with all of its fittings, can be removed as a complete unit without disturbing any other parts.

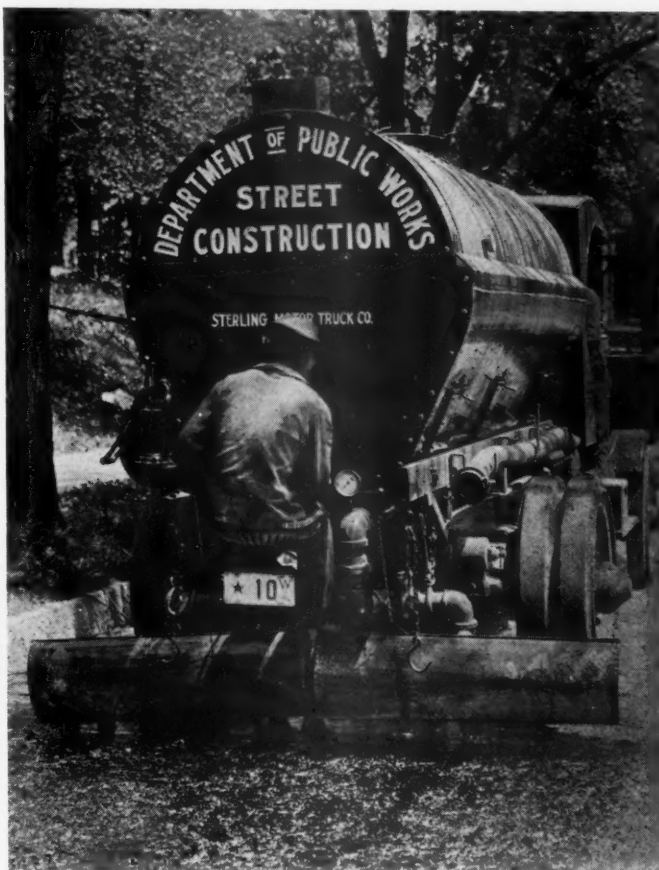
The heating system consists of longitudinal tubes extending through the bottom portion of the tank. Four burners are located under the tank and heated gases circulate through the tubes in the tank. These burners are accessible from the side of the truck. They have ample heat-producing capacity to cause sufficient rise in temperature in a few minutes to liquefy the bituminous compounds so as to flow freely, and maintain the desired degree of temperature under all conditions of weather. The gases of combustion from the kerosene burners are conducted through flues and discharged from the vertical pipe at the rear end of the top of the tank. The heating chambers are lined with asbestos.

The pump for creating sufficient pressure to distribute the road oil compound is of the rotary type and actuated from the secondary shaft of the transmission by two silent chains and operates at about 150 r.p.m. when the engine operates at about 950. It is driven by an independent shaft and controlled by an individual clutch.

The oil sprinkler nozzles are located at the rear of the truck and consist of two rows. The discharge is controlled by the operator from the rear of the truck. They have a lateral movement of about 1/2 ft.

to each side and can also be folded up and out of the way when not in use. The width of the spray covered by the nozzles is 8 ft. The nozzles are designed to deliver from 1/4 to 1 1/4 gal. per sq. yd. when the truck operates at about 2 1/2 m.p.h. The nozzles are connected with a kerosene tank so that they can be cleaned by flushing them with kerosene, which is under pressure. A semi-circular drip pan

is arranged to swing under the nozzles and catch the drippings when the valve is closed. The drip pan also acts as a windshield when the spray is in operation. The pipe is assembled with the by-pass valve so that when the nozzles are shut off, the pump continues to circulate the oil back into the tank. This also facilitates heating the oil to an even temperature. All of the oil from the tank passes through a strainer before entering the pump. The piping is so arranged as to make the equipment self loading, the pump being used to fill the tank through the strainer from the source of supply.



End View of Oiler, Showing Fan-Shaped Spray
The double row of fan-shaped spray nozzles have a range of distribution from 1/4 to 1 1/4 gallons per square yard

NEW TYPE OF RADIATOR CALLED THE "UNITUBE"

The important feature of this radiator, which should appeal strongly to the truck manufacturer, as well as the owner, is the fact that it can be quickly repaired in case of a leak or smash-up. This is made possible due to its sectional construction, being built in three, four or five sections, according to size. In case of damage the defective part can be removed and repaired, or replaced by a new one, without interfering in any way with other sections.

In this radiator the air tubes are single and separate, being placed 1-16 of an in. apart every way, thereby giving free course to the water which circulates all around them. A defective tube can be removed and replaced by another in a few minutes, at a very small expense. In case a leak is discovered while on the road, the ends of the defective tube can be plugged with cork, after which the radiator can be used indefinitely without interfering in any way with its efficiency. The maker claims that the construction of this radiator especially recommends its use on vehicles fitted with solid tires. The Unitube Sectional Radiator is made by the Unitube Auto Radiator Corp., Rochester, N. Y.



Side View of the Sterling Five-Ton, Twelve Hundred Gallon Oil Distributor
The oiler made by the Sterling Motor Truck Company, of Milwaukee, Wis., is built on a five-ton Sterling worm-gear drive chassis, with every detail of the oiling mechanism housed and running in oil

The CCJ is the only truck publication a member of the Audit Bureau of Circulations. There's a reason!

Experience of a Providence Department Store With Commercial Cars

Seven Years Ago, Started With One Machine; Now Has Twenty-Nine. Can Handle Business With Greater Dispatch; Cover Greater Area

By C. P. SHATTUCK



THE value of a commercial car lies in its ability to transport the load more miles in a day than a horse-drawn equipment or to carry a greater load the same number of miles. While it is true that cost is the determining factor in many instances, it is not always the case, for with many concerns the chief consideration is clean, rapid delivery, and the greater speed and durability of the motor vehicle makes for economical haulage when it makes twice as many trips daily as the horse-drawn equipment which it replaces. Even assuming that the cost of the automobile delivery per unit is greater than with the horse the expense is warranted if the business is increased proportionately.

This contention is proven by the experience of the Manufacturers' Outlet Co., a large department store of Providence, R. I., and covering an area equal to two New York City blocks. In 1909 the company employed 45 horses and the delivery made of merchandise was limited to the city or a radius of about 4 miles. Today the company utilizes a fleet of 29 motor vehicles, a mixed equipment, makes three city deliveries daily and daily deliveries to 113 cities, towns and villages, seven of which are beyond the borders of the State. In addition two trips daily are made to suburban places, while trucks convey special orders as far as Meriden and New Haven in Connecticut, Boston, New Bedford, Fall River and Taunton in Massachusetts, and to the extreme southern parts of Rhode Island.

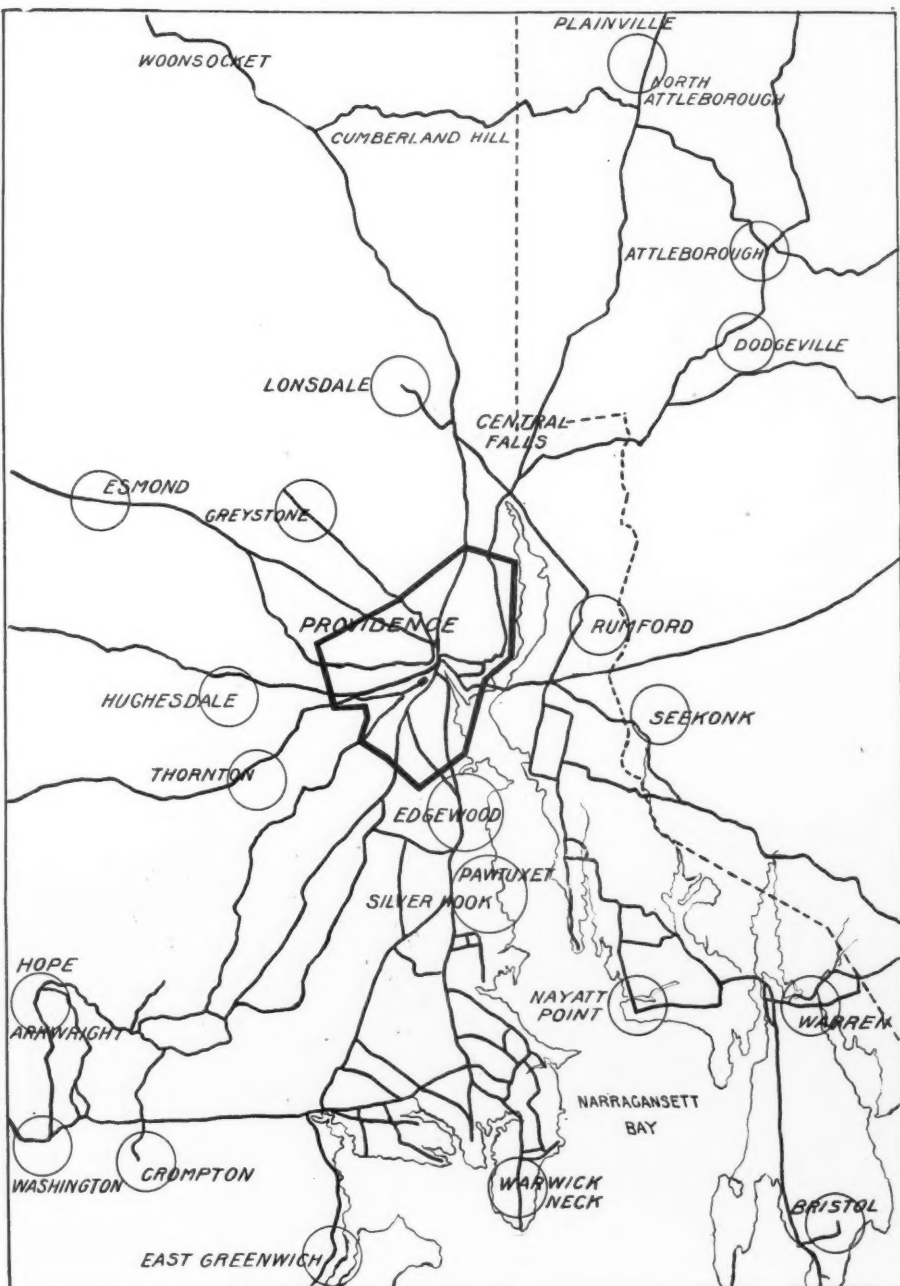
Providence, the second largest city in New England, is, in a way, peculiarly located. It lies in a hollow surrounded by hills, some having a grade of 15 ft. in 100, and the maximum height is 210 ft. The city is divided by the Providence River, which empties into Narragansett Bay, communicating with the ocean. On both sides of the river and bay are towns and villages, the inhabitants of which are well served by electric and steam roads, and the population of these places is considerable. Both sides of the river and bay abound with summer cottages and the residents are largely supplied by Providence merchants employing motor service. Southeast of Providence is the Pawtucket valley, having a large number of towns and villages, and northeast is the city of Pawtucket and the Attleboros, the latter in Massachusetts, all large purchasing communities and catered to by Providence merchants.

As may be noted by the accompanying map, it is not possible to cross the river or the bay with a vehicle except by two bridges located in the city. Consequently merchants delivering merchandise to places on the east shore must return to the city if goods are

to be delivered on the west shore. This means that two machines must be utilized. Another disadvantage is that the roads leading to the surrounding towns are not the best. While a network of state roads have been built they have not been maintained owing to a lack of money.

The progressiveness of the Outlet Co. led it to purchase its first automobile, an Auto-car, in December, 1909. The results justified the judgment of the company and repeat orders were given until at the present time

13 are in service. The horse-drawn vehicles were continued in decreasing numbers for city delivery, but these were gradually replaced by a fleet of electrics of different capacity and equipment. At the present time five 1000-lb. Commercials deliver packages within the city limits and are known as the package fleet. The electrics proved so efficient that last August three 1-ton Walkers were placed in service and are employed for hauling heavier merchandise within the city limits. In addition there



Map Showing Providence and Surrounding Towns

The CCJ has most readers because it gives most information

are two 1-ton Commercial electrics which deliver furniture, also a 2-ton and a 3½-ton Commercial which haul freight, etc.

The company found by experience that the 1000-lb. capacity electrics were not adapted to the work; that is, owing to the grades in and around the city economical results were not obtained with solid tires and the standard motor. A heavier type of motor was installed and each machine was equipped with quick detachable, quick demountable rims. It has been found that not only is a greater mileage obtained from the batteries, but there is less breakage of fragile goods. It is stated that these changes have reduced maintenance costs to a marked degree. Both lead and Edison batteries are employed, seven of the latter being in service.

In addition to the cars enumerated the company has made use of four Fords and these have been in service for the past three years. These average a large number of miles daily. For example, the machine used by the men installing window shades, awnings, etc., and having a special body, travels from 50 to 150 miles a day. The Ford utilized by the Victor talking machine department frequently covers 100 miles a day as Rhode Island and portions of Massachusetts and Connecticut are covered in making deliveries. Another Ford is employed by the carpet and linoleum department and the car is also used for rush work. It averages 60 miles daily. The fourth Ford is connected with the retail department and for making collections. Its daily average is 75 miles. These figures are taken from the records made of the odometer readings and the daily mileage of every machine is kept track of.

The map shows the territory covered by the machines making deliveries. The electric package fleet averages about 27 miles a day transporting merchandise within the city limits while the gasoline vehicles make regular deliveries twice a day to the places indicated by the larger circles in the map. Daily deliveries are made on the east shore as far as Bristol 16 miles and intermediate towns and villages. On the west shore the cars go as far as East Greenwich 13 miles,

making many stops. The limit of delivery to the southwest is Washington in the Pawtuxet valley, and the machines go as far northeast as Plainville, Mass. These are the distance points made in the daily delivery and are indicated by the small circles on the map. The lighter lines denote detours as well as the places visited. Some idea of the service rendered by the cars may be obtained from the statement

light material which is packed or bundled in the store and sent to the loading floor of the garage, the merchandise is carried in the warehouse and brought from the different floors by elevators to a special loading platform.

At present the light material is brought from the shipping room of the store by "bundle hoppers," boys who accompany each machine. The packages are placed in numbered bins by the packers and each route is numbered. At the rear of each car in the garage is a wooden rack about three inches high which serves to prevent a bundle from coming in contact with the floor. The material is sorted and loaded by the driver according to his route, and it is stated that the drivers have become so proficient that he checks up his daily delivery sheet at the conclusion of the day's work. Superintendent of transportation, John P. Dooley, is proud of his drivers and says that their memorizing is a factor in the prompt delivery, particularly the city men who average 200 packages. In delivering the drivers divide the work with the "bundle hopper," the latter meeting the car at a distant point. In this way much faster progress is made.

The company believes in paying their drivers good wages and employing efficient men. Although the heads of the departments are looked to for results the fact that the majority of drivers have been with the company for some time proves their efficiency. The men are unionized, are given two weeks' vacation with pay and are paid overtime on holidays. As the store closes one afternoon each week for 10 weeks during the summer, and the company employs its machines for giving outings to the inmates of orphan asylums, etc., the drivers earn a considerable bonus.

The men report in time to load their cars and to start at a given time. Upon completing their work they make out a daily report sheet on which is entered their name, number of car, start and finish readings of odometer, meter readings, (start and finish) stops made, and if any minor repair or adjustment be required this is given in the report. The slips are placed in a rack and are taken out by the head night man and any work required attended to.



The Outlet Company's Warehouse and Garage

that 4,000 packages are handled daily and over 6,000 during sales and the holidays.

The building occupied by the Outlet Co. is on streets having considerable traffic, particularly Weybosset and Pine streets. Both Eddy and Garnet streets are used by heavily loaded vehicles and to prevent congestion and to avoid delays the company combined its garage and warehouse, utilizing the ground floor for loading its vehicles. The combined garage and warehouse is one of the largest and best equipped in New England and is directly across the street from the store. With the exception of



Interior Views of the Outlet Company's Shipping Department

On the left, loading the package electrics; right, the heavy merchandise is loaded at a platform and is brought from the various floors by elevators

The CCJ has most advertisers because it gives them biggest returns

Cars equipped with pneumatic tires carry one extra shoe and two spare tubes. In the event of a puncture or a blowout the driver must turn in the tube or shoe to obtain a new one and this is done before the driver leaves at night. A record is kept of all tires and tubes, including mileage. No driver may obtain fuel without signing a slip obtained from the floorman. Drivers are given access to the lubricating oil, the company believing that this method obtains the best results.

The garage and warehouse is a modern, fireproof construction built of brick, steel and concrete with glazed and wire glass windows and steel window panels. The large floor area of the garage facilitates loading of the different machines and there is sufficient space for a machine to enter and leave when the other cars are being loaded. The main entrance faces the store and there is a second entrance on another street. There are but four radiators in the building, these being located on the ground floor as hot water is employed for heating, it being circulated by a pump located in the basement through the sprinkler fire extinguisher supply pipes. One of the features of the building is that water may be drained separately from each floor, avoiding the possibility of flooding. Two elevators are utilized for conveying goods from the upper floors to the loading platform on the garage floors, and these elevators have separate wells with metal doors that drop automatically in case of fire. The stairs leading to the various floors and to the repair shop in the basement are fireproof, and the switchboard controlling the current for lighting and charging is located in a fireproof room.

A 5-ton capacity elevator is employed for conveying the various machines to the repair shop which has a capacity for completely overhauling five large cars. The repair shop is unusually well equipped to handle any work and has among its equipment a large arbor press, lathes, grinders, drill press, brazing stand, forge, oxy-acetylene welding and decarbonizing equipment, hoists, etc. The tool equipment is most complete, including, as it does, the latest time and labor saving devices. Adjoining the repair shop is the stock room in which is carried a complete stock of spare

parts for each type of car in service. The company maintains a vulcanizing plant but all work on solid tires is sent outside, an arrangement being in force that affords the best of service. A day and night force of repairmen keep the machines in an efficient condition. The day men overhaul as well as make adjustments, etc., but the night men make minor repairs and adjustments. If the slip or report of a driver calls for more extended work a report is made out and given to Superintendent W. T. Ashworth of the garage, who lays out the work for the day men. An emergency car is always ready with workmen to go to the aid of any disabled machine and this car is unusually well equipped for the work. Every machine is thoroughly overhauled once a year.

In garaging the machines the electric are separated from the gasoline, the former being located at one end of the building. The arrangement is such that the batteries can be connected to the charging outlet without moving the car which is ready to start out with its load in the morning. Charging is by a Cutler-Hammer 16 battery capacity panel. The batteries are removed but once a week for flushing and an extra charged battery is always available.

While no figures as to costs per package are given, a member of the company stated that the motor vehicle has made it possible to handle its deliveries with greater dispatch as well as has increased carrying capacity per unit. The machines also have made possible the covering of a greater area than with horse drawn vehicles, express and other means of transportation. The same member of the firm stated that the electric vehicles had demonstrated that they could be operated and maintained at 25 per cent. less cost than the gasoline cars. This applies to the city deliveries and work formerly accomplished by the gasoline cars which, as previously pointed out, consists of short distances and having as many as 200 stops daily.

The success of the Outlet Co. with motor vehicle transportation has been of value to truck dealers in Providence and many merchants who have hesitated to adopt the more efficient method of transportation, because of the topography of the city,

are now replacing their horse drawn equipment with motor vehicles. There appears to be an excellent field for the electric vehicle for short hauls as well as for the gasoline car in suburban delivery. The business competition existing among merchants catering to suburban and out of town trade is a factor that is aiding dealers in truck sales.

WASHINGTON EXPERIENCES LITTLE DIFFICULTY WITH USED TRUCKS

Washington is just on the edge of the problems involved in the used truck proposition. Washington, as has heretofore been pointed out in these columns, is in a class distinct from other cities as far as the automobile business is concerned. This distinctive classification applies especially to the commercial car or truck. Unlike the situation in other cities, the biggest buyer in Washington of trucks is the United States Government. There are two reasons for this. One is that the federal government is by far and away the biggest corporation in this municipality. In fact, any one of the nine executive departments of the government constitutes in itself by far the largest institution in Washington. Again, the District of Columbia contains more street paving to the mile, possibly, than any similar area in the United States. The wear and tear on trucks therefore in this locality is but slight compared with that on trucks in other localities, making fewer used cars for sale.

The federal government, the biggest truck buyer here, never buys a used truck so there is little need for agents to puzzle themselves with the question of the second-hand commercial car.

Still further, the trucks used here outside of the government service, constitute but a small proportion of the commercial cars in the District, and as most of the automobiles for business purposes sold here to private institutions go to the department stores, and like business houses which do not have heavy hauling to do, the used truck problem is again partially disposed of.

Naturally, truck dealers here get in a certain number of used cars but this is the result of an old car being occasionally traded for a new one. There is not a sufficient number of these however to justify the local truck dealers in giving special attention to this problem, although as time goes on, it may be necessary for the dealers to devise some comprehensive scheme for disposing of such cars. At present those used trucks which cannot be disposed of readily are sold to local auctioneers.

Commercial Auto Body Co., 16th and Pine Sts., St. Louis, Mo., is erecting addition to factory to provide dry kiln and special wood-working shop.

The National-Acme Mfg. Co., of Cleveland, O., has adopted a new standard size of set screw head, which size will be applied to all sizes. In the new size the height of the head shall be equal to three-quarters the diameter of the body. Either standard will be furnished optional until January 1, 1917.



Hauling an Eighteen Hundred Year Old Tree

The Packard truck is hauling a walnut log 18 ft. long and 7 ft. in diameter, weighing 12 tons. The truck was equipped with Goodyear S. V. truck tires

The CCJ leads in circulation, advertising and prestige



New International Model H, Fifteen Hundred Pound Delivery Car

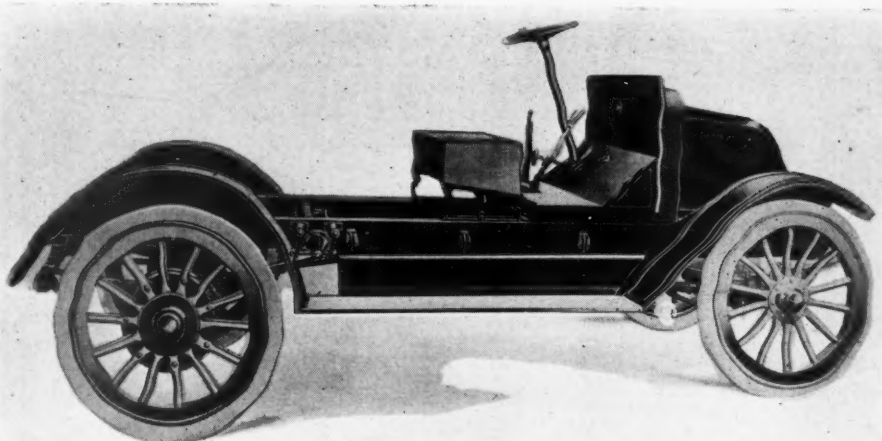
THE International Harvester Co. of America, Chicago, Ill., is announcing a new Model H, 1500-lb. commercial car, the chassis price of which is \$1225 f.o.b. Akron, Ohio.

Engine

The engine in this International model has gone through several years of test and service and is the same design which has been used in the International Model F. It is of the four cylinder L-head, long stroke type, built complete in the International plant. The materials are of the highest quality, combined with superior workmanship. The cylinders with the intake passage and water manifolds are included in one casting. The carburetor is located on the left side and the gas is heated by passing between the second and third cylinders to the intake valve on the right side. This feature makes for economy in fuel consumption. The valve rods are adjustable and are operated by a camshaft en-

tirely enclosed in the crankcase. The valve stems and springs are enclosed, but are easily accessible through a removable plate. The engine is lubricated by a constant pres-

sure feed system and the engine cannot be started without starting the oil pump. This system insures proper lubrication of the engine with minimum oil consumption.

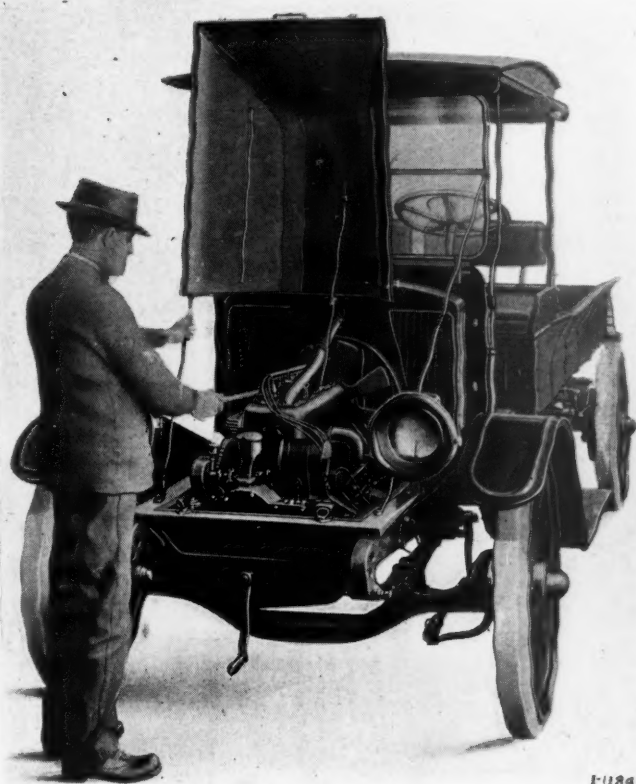


International Model H Chassis

Has selective sliding, three-speed transmission, cone clutch, internal-gear drive rear axle, semi-elliptic springs in front, platform springs rear. Chassis price, \$1225

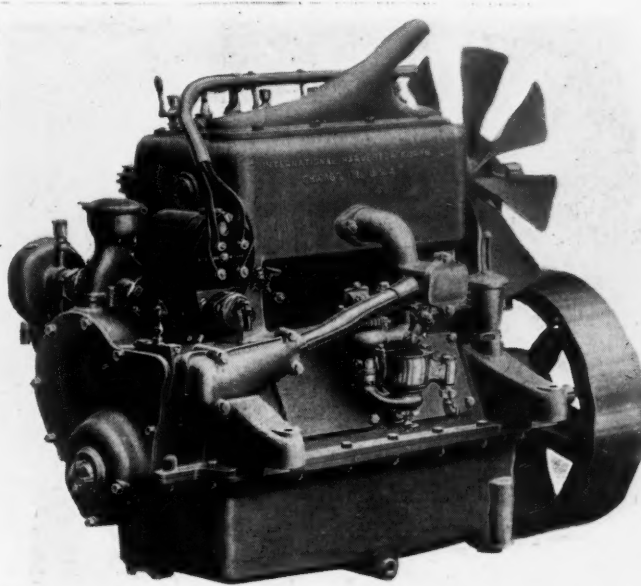
The bore is $3\frac{1}{2}$ in., stroke $5\frac{1}{4}$ in., cooling by centrifugal pump with large vertical tube radiator and fan. The radiator is located next to the dash, and the pump is mounted on the cross shaft in front of the engine.

Ignition is by means of a Bosch high tension magneto, the spark advance lever being on the steering wheel. No batteries are re-



Front of International Model H

Location of engine makes it readily accessible. Spark plugs, magneto, pump and carburetor are all within easy reach



International Model H Engine

This is a simple, compact engine and is governor-controlled, which prevents overspeeding. Bore, $3\frac{1}{2}$ in.; stroke, $5\frac{1}{4}$ in.

The CCJ brings greatest returns to advertisers because of largest circulation among quantity buyers

quired. The carburetor is a Holley, Model H, $1\frac{1}{4}$ in., with adjustable hot-air supply. Control of the carburetor is either by the hand lever on the steering wheel or the foot

beam 35 point carbon steel heat treated member and has large steering pivots which are hardened and ground, and work in hardened bushings provided with ample lubricating facilities. The steering knuckle is of nickel steel, heat treated.

The service or foot brake is of internal expanding type, the emergency or hand brake being of external contracting type. Both these sets of brakes are asbestos lined and operate directly on the rear wheel drums.

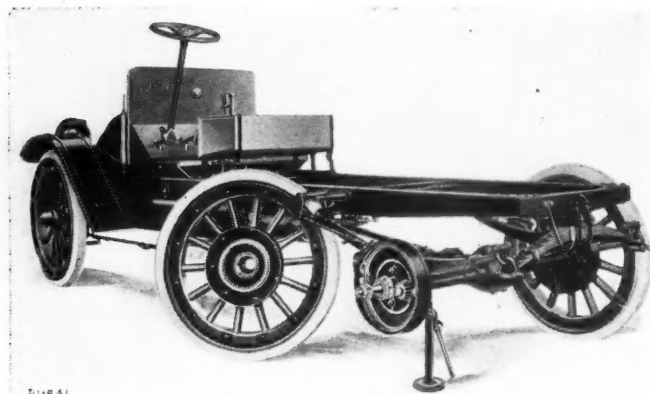
Wheels are of artillery type, 36 in. in diameter outside tire, with $3\frac{1}{2}$ in. rear and 3

x $2\frac{1}{4}$ in., while the rear set are of the platform type, $2\frac{1}{2}$ in. wide.

Control is on the left side, with spark and throttle levers on the steering wheel and foot accelerator on floor board. The service brake and clutch are operated by pedals and the gear change and emergency brakes are operated by levers located in the center of the driving compartment at the driver's right hand.

Some of the dimensions are as follows: Frame, 5 in. deep with five cross members; wheelbase, 115 in.; height of loading platform without load, $34\frac{1}{2}$ in.; length of chassis overall, 160 in.; length of truck (including body) overall, 183 in.

On special order, at additional cost, the following equipment will be furnished: Open express body with 6 in. flareboards and upholstered seats; inside dimensions, 90 in. long, 44 in. wide, 12 in. deep; cab top; full length top; electric starting and lighting system; combined speedometer and odometer; oil dash-lamps, storage battery, windshield, skid chains, pneumatic tires 36 x



International Model H

Showing rear wheel removed, exposing driving pinion of internal gear. Also note the platform springs

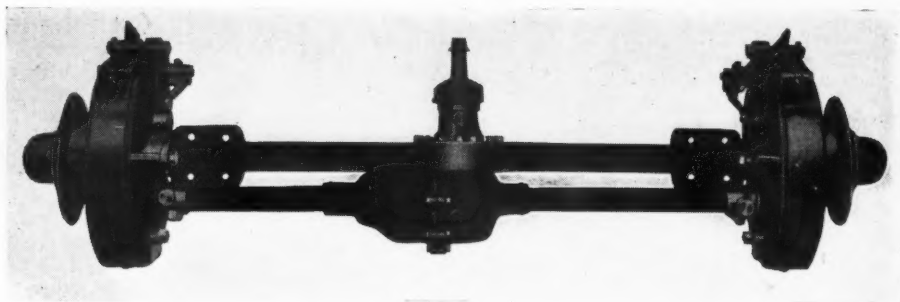
accelerator. The gasoline tank is located under the driver's seat, with a capacity of 17 gal., and a reserve capacity of 2 gal. A gage is located on the dash.

Transmission and Clutch

The transmission is of selective sliding type, giving three speeds forward and reverse, with direct drive on high gear. The clutch is a leather-faced cone type member and has springs beneath the leather to give easy engagement.

Axles, Brakes and Wheels

Drive is by means of internal gear, there being a tubular propeller shaft with universal joints at each end connecting the transmission with the rear axle. The rear axle is a heat treated steel drop forging for carrying the load, and a live axle for transmitting the power. The front axle is an I-



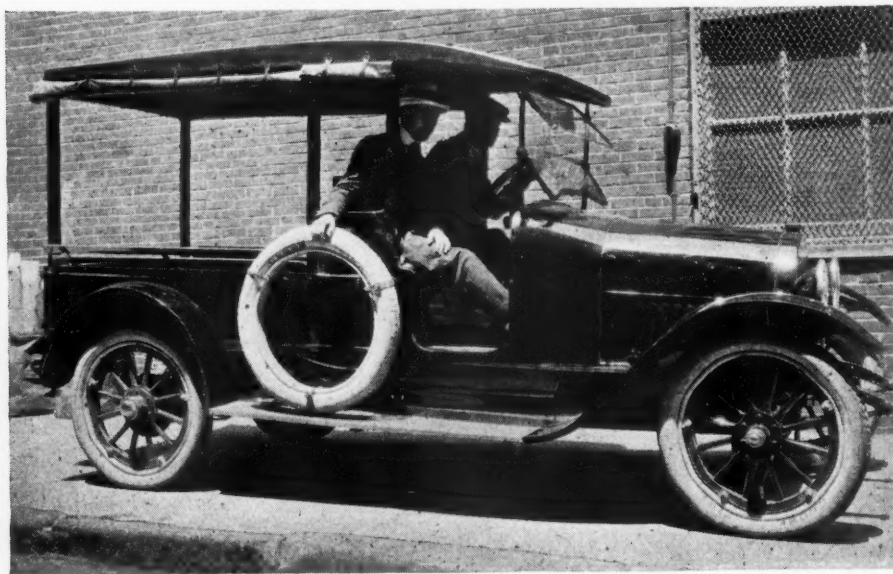
Top of International Rear Axle

Note the heat-treated steel axle for carrying the load, and the live axle for transmitting the power

in. front S. A. E. hard base, pressed on, solid tires. Each wheel is provided with two roller bearings.

The springs are semi-elliptic in front, 40

5 in. non-skid in rear, plain tread in front, or demountable rims, solid tires, will be furnished at additional cost when so ordered from factory.



Pullman Light Delivery Car

The Pullman light delivery car is brought out on a special chassis, sturdy, for maximum loads, but light enough for plenty of snap and ample speed. The wheelbase, 114 in., is exceptionally long for a delivery car of its class. The normal load capacity is one thousand pounds, filling all the requirements of a hundred different forms of business.

PULLMAN ANNOUNCES A LIGHT DELIVERY CAR

The Pullman Motor Car Co., of York, Pa., has made formal announcement of the Pullman light delivery car, embodying many features of the Pullman touring car, combined with all the latest improvements to be found in light truck construction.

An important mechanical advance is the independent magneto system of the Dixie water-proof, high-tension type.

The special full 50-in. cantilever rear springs, too, are unique in a light delivery car of this class.

The engine of the light delivery car is of the four-cylinder style, 32 h.p., cast in block, $3\frac{3}{4}$ in. bore and $4\frac{1}{4}$ in. stroke, with enclosed valves. The Stromberg carburetor is used, thermo-syphon cooling system and Pullman honeycomb radiator. It is a left-side drive car, with center control, with emergency brake lever forward of center and out of the way. A $9\frac{1}{4}$ -gallon gasoline tank is carried in the cowl.

All four wheels are equipped with Batavia non-skid tires. Two standard bodies are provided, the car complete with the express type body at \$750 and the panel type body at \$775.

The CCJ is the only truck publication a member of the Audit Bureau of Circulations. There's a reason!

Day-Elders Worm-Drive Commercial Car Announced in Two Capacities



THE Day-Elders Motors Co., 161-167 Ogden Street, Newark, N. J., is one of the latest concerns to enter the commercial car manufacturing field. If the company's beginning may be taken as a criterion it bids well to become one of the leading producers. The company incorporated with a fully paid in capital of \$100,000, and consists of men who have had extended experience in the automobile manufacturing field. The officers of this concern are Charles P. Day, president; George A. Gemmer, Harry H. Hay and Alfred W. Gieske, vice-presidents; Fred G. Elder, treasurer, and Theodore McC. Marsh, secretary. Mr. Gemmer is the inventor of the Gemmer steering gear, while C. E. Campbell was formerly connected with the Continental Motors Co., General Motors Co. and the Rutenber Motor Co.

For the first fiscal year of the company which ends June, 1917, 1300 trucks will be built. One thousand will be built of the 1250 lb. model, known as the "D-E Junior" and three hundred of the 2000-lb. model, the "D-E Senior."

Lubrication is by splash with constant oil level supplied from reservoir in lower part of oil basin. Positively driven pump forces oil through tubes to trough under each of the connecting-rods. Oil is strained each time it enters the pump.

Carburetor is of Schebler make, while ignition is by Splitdorf high tension magneto. The gasoline is positively fed from a 15 gal. tank by the Stewart-Warner vacuum system.

The rear axle is of Sheldon worm drive construction.

The clutch is of multiple disc, dry plate type. Control levers are centrally located,

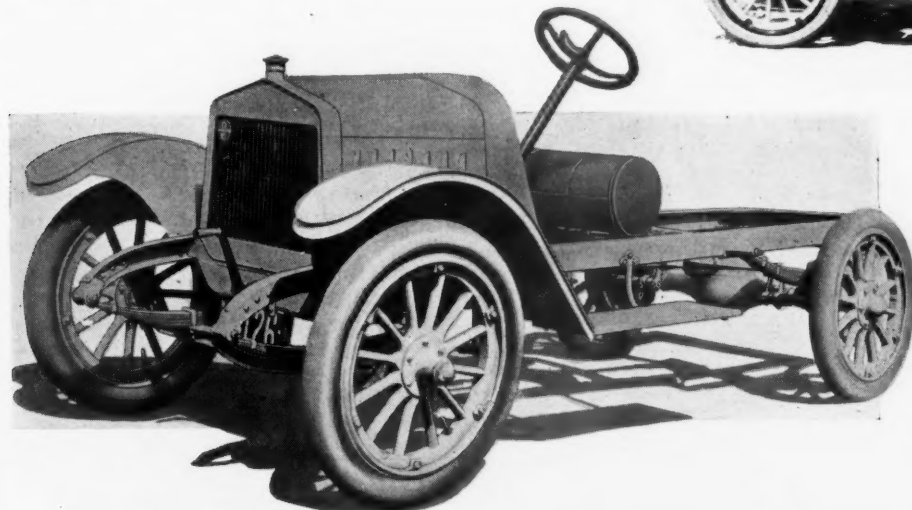
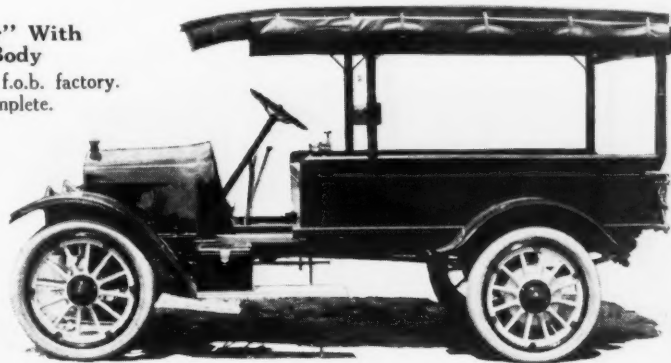
with steering wheel at the left, hand throttle and spark levers and foot accelerator.

The chassis dimensions are as follows: Length overall, 153 in.; width overall, 63½ in.; dash to rear of frame, 110¼ in.; rear of seat to rear of frame, 70¼ in.; extreme width of frame, 34½ in.; width of driver's seat, 42 in.; depth of driver's seat, 16 in.; seat to dash, 24 in.; height to top of frame from ground, loaded, 25⅞ in. The frame is of pressed steel, 3 15-16 in. deep section; 5-32 in. gage.

The brake equipment consists of foot brake, internal expanding on rear wheel, operated by foot pedal; emergency brake,

The D-E "Junior" With Flareboard Body

Price of chassis \$875, f.o.b. factory.
Body as shown, \$110, complete.



The D-E "Junior" Chassis

Note the good-looking lines as well as staunch construction

Both models are assembled propositions throughout, of which fact the company is justly proud. Only such units have been selected that have won meritorious recognition by the trade, thereby guaranteeing the user a machine of quality construction.

The D-E "Junior" Twelve Hundred and Fifty Pound Model

The engine is a Le Roi, four-cylinder, L-head type, cylinders cast in block; bore 3⅞ in., stroke 4½ in.; 26 h.p. The transmission is made by the Detroit Gear & Machine Co., and is attached direct to the engine by bell housing. It has three speeds. The entire power plant is three point suspended.

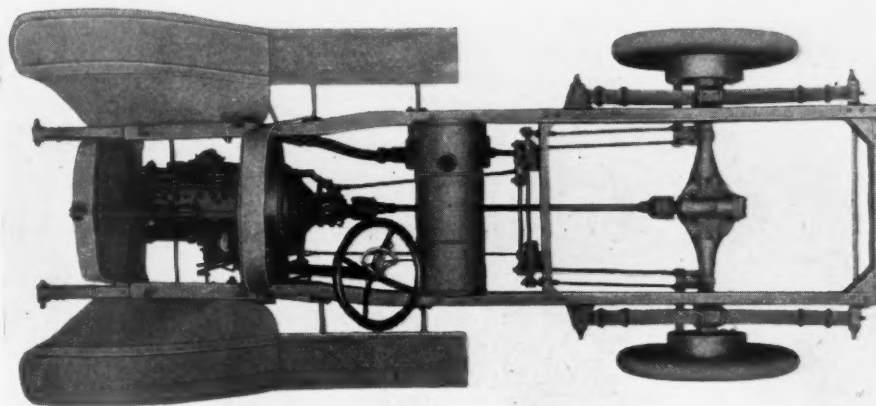
internal expanding on rear wheel, operated by hand lever. Both brakes equalized.

The springs are semi-elliptic front and rear. Front, width 2 in.; length 36 in. Rear, width 2¼ in.; length 50 in.

The standard equipment consists of two oil dash lamps, tail lamp, horn, jack, complete set of tools.

The loading space back of driver's seat on standard body is 44 x 74 in.

The steering gear is of Gemmer make, full worm wheel, semi-irreversible, adjustable ball thrust bearing, easily adjusted; 17 in. steering wheel.



Top of Chassis of the D-E "Junior"

The drive in this, as well as in the one-ton model, is by Sheldon Worm

The CCJ has most readers because it gives most information

Tires, front, 33 x 4 in. pneumatic; rear, 33 x 4 in. pneumatic.

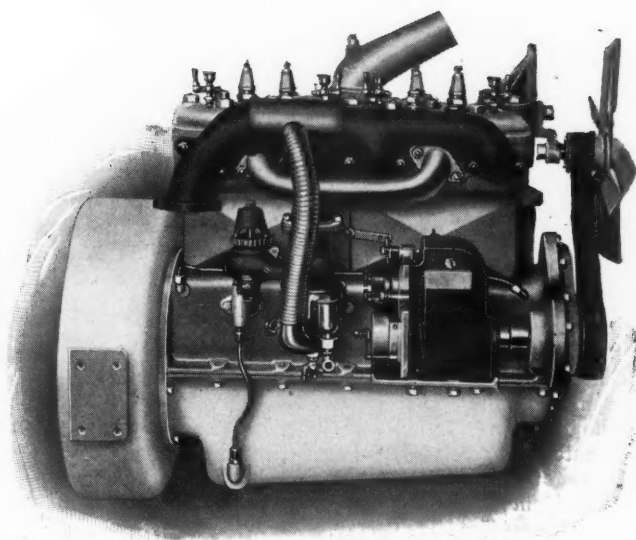
Wheels are heavy artillery S. A. E. wheels of second growth hickory. Wheel-base is 108 in.

The price of chassis, painted, complete, is \$875 f.o.b. factory. Electric self-starter and lights, including head-lamps, \$85 extra. Metal panel fore-door delivery body, \$125; four post flareboard body, with canopy top and curtains, \$110.

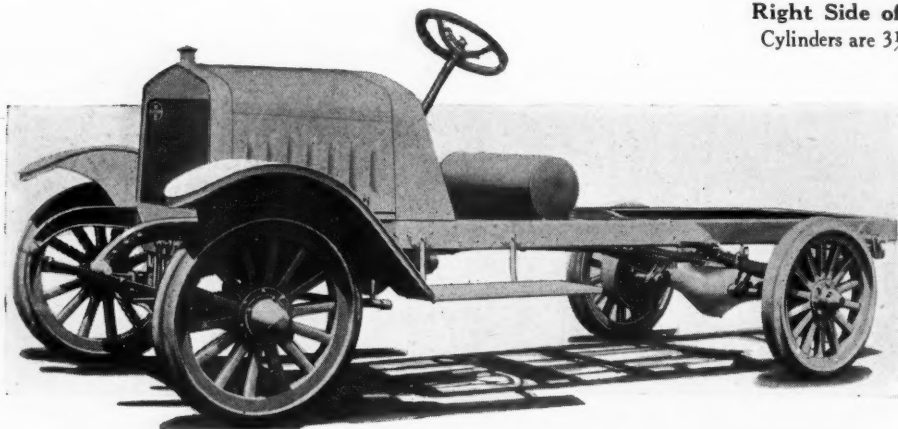
Specifications of the D-E One-Ton "Senior" Model

The engine is of Continental make, $3\frac{1}{2}$ x 5 in., 30 h.p., four cylinder; thermosiphon cooling. The frame is of 5 in. deep section, 3-16 in. gage.

Chassis measurements are as follows: Length overall, 187 in.; width overall, 66 in.; dash to rear of frame, 135 $\frac{1}{4}$ in.; rear of seat to rear of frame, 96 $\frac{1}{4}$ in.; extreme



Right Side of the Le Roi Engine
Cylinders are 3 $\frac{1}{8}$ in. x 4 $\frac{1}{2}$ in., 26 h. p.



The D-E One-Ton "Senior" Model

A Continental engine, $3\frac{1}{2}$ x 5 in., is used in this model

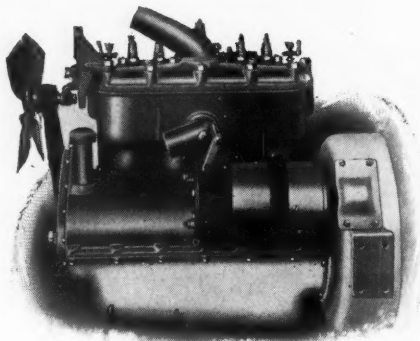
width of frame, 35 in.; height to top of frame from ground, loaded, 29 in.; width of driver's seat, 42 in.; depth of driver's seat, 16 in.; seat to dash, 23 in.

Carburetor is of Zenith type.

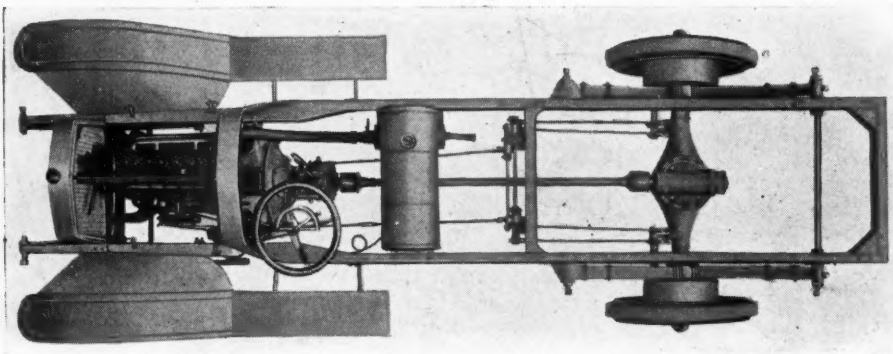
Springs are semi-elliptic front and rear. Front, width 2 $\frac{1}{4}$ in.; length, 40 in. Rear, width 2 $\frac{1}{2}$ in.; length 54 in.

Tires are 34 x 3 $\frac{1}{2}$ in. front, solid. Rear, 34 x 4 in. solid. Pneumatic tires optional.

Price of chassis, painted, complete, \$1450 f.o.b. factory. Electric self-starter and lights, including head lamps, \$85 extra.



Left Side of the Le Roi Engine
Electric starter is furnished when desired, at \$85 extra. This price includes electric lights



Plan View of the D-E "Senior" Model

The CCJ has most advertisers because it gives them biggest returns

A slightly larger worm drive rear axle is used on this model, outside of which all other specifications are the same as for the smaller model.

MOTOR TRUCKS LOWER COST OF LIVING

Every motor truck installed by a merchant, every motor truck installed by a farmer, in fact every motor truck installed by anyone who has hauling to do, lessens the high cost of living for all of us, says T. J. Hudson, manager Motor Truck Department, Chicago Pneumatic Tool Co., Little Giant Bldg., 1615 Michigan Ave.

"It costs the producer 44 cents to haul 100 lbs. of wool from the ranch to the shipping point with horse-drawn vehicles, while a Little Giant truck could haul the same load for 10 cents. This is an unnecessary waste of 34 cents on every hundred pounds of wool shipped. Everyone who wears clothes must help pay this loss. It costs 9 cents to haul 100 lbs. of potatoes from farm to shipping point by horse and wagon. A Little Giant would do the same work for 2 cents. Everyone who eats potatoes must pay their share of the 7 cents that is wasted. Thus it is with everything we eat or wear. Society is paying a high price for its inefficient horse and wagon delivery system, and everyone who is anxious to reduce the present high cost of living should do all they can to induce their neighbor, if he does any hauling with horses and wagons, to replace them with motor trucks."

CORRECTION

Since publishing a description of the Iowa chassis for converting a Ford car into a truck, in our June issue, page 32, a few errors were discovered in the specifications. The wheelbase of Model E is 116 in., not 124 in. The wheels are 32 x 3 $\frac{1}{2}$ in. artillery. The price is \$375 instead of \$360. The Model F sells for \$450, not \$425.

Velie Biltwel Trucks, Models 25 and 26

THE announcement of the new Velie "Biltwel" line of commercial cars marks a distinct advance in motor truck construction. The best in design is made use of by the Velie Motor Vehicle Co., Moline, Ill., and the best obtainable nickel and chrome steels, drop forgings and steel castings are found in these trucks. The inviolable use of jigs and dies makes possible an interchangeability of parts necessary to immediate and inexpensive replacement.

The principles of construction used in building the 1½, 2 and 3½-ton worm drive Velie trucks are the same; a detailed mechanical description of the one will, therefore, suffice for the other, the exceptions made advisable by difference in capacity being noted.

Both classes are furnished complete with all equipment—with or without a standard body. If body is to be built locally a working print will be forwarded which will enable the body builder to immediately begin work of manufacture.

Engine

The engine of the Model 26 is a four-cylinder Continental vertical poppet-valve type. The cylinders are cast in pairs and are mounted on an aluminum crankcase. The bore and stroke of the engine are 4½ x 5½ in. respectively.

The engines are located in the chassis directly ahead of the driver's seat, and are supported at four points on a sub-frame and allows easy access to all points upon raising the hood. The engine speed is controlled positively by a centrifugal governor allowing a maximum truck speed of 14 m.p.h. on Model 26, and 18 m.p.h. on Model 25.

Cooling System

The three principal units of the cooling system are water pump, radiator and fan. The water pump is of the centrifugal type and designed especially for engines used in connection with heavy duty trucks. The

pump is capable of maintaining a positive circulation at all times. The pump connections are generous in size, readily allowing a free passage of the water.

The water jackets in the cylinders are of equally generous dimensions and are so designed as to eliminate the formation of steam pockets and also to equalize the cooling of all four cylinders. Extra pains have been taken in the radiator design, inasmuch as radiator trouble is akin to tire trouble.

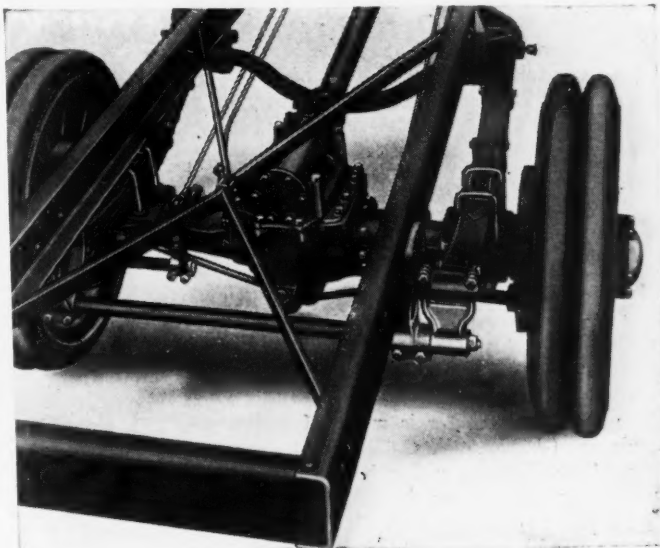
The new Velie radiator is built up of removable water tubes, held by a steel jacket; through this ingenious construction it is possible to replace damaged or frozen tubes within a short time and at little expense without the necessity of replacing the radiator, or effecting a repair which would reduce its efficiency. The radiator filler is large, that water may be added in an expeditious manner.

The radiator is mounted on two springs which entirely eliminate road shocks and twisting strains. The fan is 20 in. in diameter on Model 26, and 18 in. on Model 25. It is mounted on two annular ball bearings. Ample adjustment is provided for fan belt stretching, it only being necessary to loosen one cap bolt.

Lubrication

The lubrication is accomplished by two plunger oil pumps driven from an eccentric

on the camshaft. The system is called a combination force and circulating splash. The rear bearing and front gears are lubricated by the oil from one pump while the oil from the second pump is fed to each connecting-rod compartment. The cylinders and wrist pins are lubricated by the splash from the connecting-rods. A double pro-



Velie One and a Half Ton Rear Construction
Showing Timken worm-drive rear axle, cross-braced frame and dual tires on rear

tection is therefore offered against possible driver carelessness.

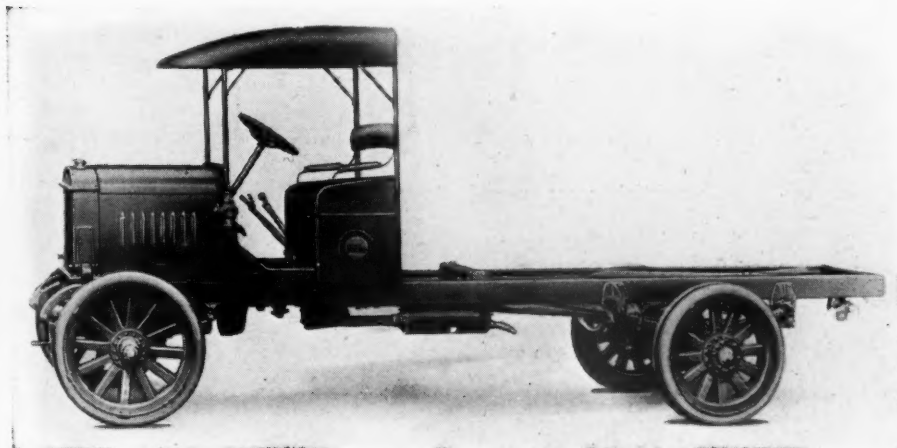
Ignition

The ignition system on both trucks is Bosch High Tension. All wires are enclosed in a conduit which adds very much to the appearance under the hood. The spark is variable. The magneto is located on the right side of the engine in a very accessible position. It is connected to the driving-shaft by a flexible coupling, eliminating trouble from vibration or any slight variation in its location.

Transmission

The transmission is a selective four-speed sliding gear type. Together with the engine it is mounted on a special 4 in. channel-steel frame amidship. The gears and shafts are 3½ per cent. nickel steel of unusual size and strength. The shafts are mounted on Timken roller bearings. The total gear reduction on direct, or fourth, speed is 10 1-3:1 on Model 26, and 6:1 on Model 25.

Any variation in alignment between the engine and transmission, as well as the throw-out movement of the clutch, is taken up by a large flexible joint composed of composition rubber discs bolted together. This joint requires no attention whatever and performs its work noiselessly.



Velie One and a Half Ton Chassis

The chassis of the three and a half ton model is very similar in appearance, so we have not shown it

The CCJ leads in circulation, advertising and prestige

The drive between the transmission and rear axle is taken by the Spicer propeller-shaft with two points, one at the transmission and one at the axle. The shaft is tubular, used to prevent whipping.

Carburetor

A Stromberg carburetor is used and has provision for both high and low speed adjustment. The fuel supply is controlled by either the foot accelerator or a throttle lever on the steering post.

Clutch

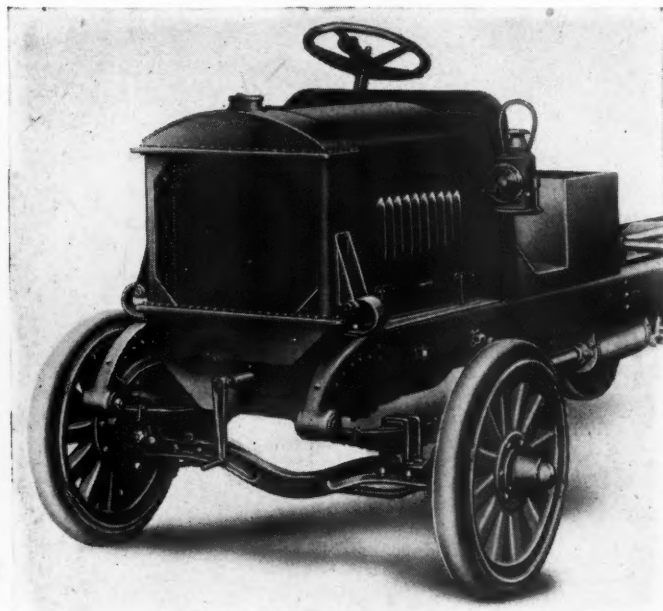
The clutch is a special Velie design. It is of a dry-disc three-plate type, two plates being of Raybestos, which grip a third steel driving plate between them. The adjustment is very simple, it only being necessary to loosen two cap screws and either screw the clutch cover in or out—as the clutch needs be tightened or loosened.

Rear Axle

The rear axle is of the full floating type, there being two bearings in each driving wheel. The drive from the propeller-shaft is through a Timken-David Brown worm and gear mounted on Timken roller bearings. The driving-shafts are of nickel steel. The differential is adjustable bevel gear type.

The front axle center is made of vanadium steel, I-beam section. The wheels are mounted on Timken roller bearings, and the steering knuckles on the Model 26 also carry Timken roller bearings which support the weight of the truck and make steering easy.

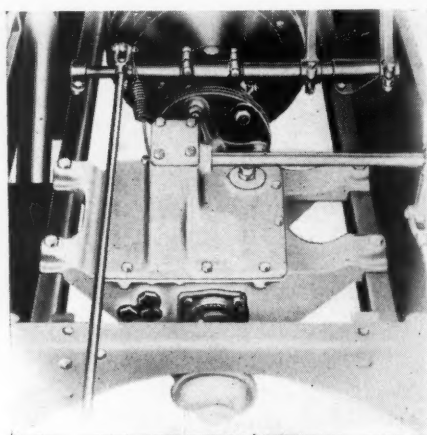
The brakes on the rear axle are of the internal type, there being two brakes in each drum. The elimination of the external brake cleans up the appearance of the rear axle and does away with rattle and dirt. Brakes on the model 26 are 18 x 4 in., and on the Model 25, 16 x 3 1/4 in., Raybestos covered, powerful, quiet and reliably efficient.



Velie Three and a Half Ton Truck

Forward view, showing frame strength, semi-elliptic front springs, dropped front axle and easily repaired radiator

The size of the front wheels on Model 26 are 36 x 5, equipped with single solid tires. The spokes are twelve in number, 2 1/2 in. square, made of the best grade hickory. The felloes are made of the best grade of oak. The rear wheels are 40 in. in diameter equipped with 5 in. dual solid tires. The spokes are also of hickory, with oak felloes, fourteen in number, and 2 1/2 x 3 1/2 in. in section.



Velie Disc Universal
Composed of composition rubber discs bolted together

The size of the front wheels, Model 25, are 36 in., equipped with 36 x 4 single solid tires. The spokes are twelve in number, 2 in. square, made of best grade hickory. The rear wheels are 36 in., equipped with 36 x 3 1/2 in. dual solid tires. The spokes are 2 1/2 x 2 1/2 in. cross section.

Springs

The front springs of Model 26 are semi-elliptic, 3 x 46 in., made of alloy steel. The rear springs are 3 1/2 x 54 in., also of alloy steel. The springs are designed so that under full load they are nearly horizontal.

The rear springs are located outside of the frame, which materially reduces its height and also lowers the center of gravity of the chassis. Both front and rear springs are cupped.

The main frame of Model 26 is of 8 in. pressed steel section. All joints are hot-riveted and amply supplied with substantial cross members. The height of the frame from the ground is approximately 36 in. Load length available is 158 in., on 1 1/2-2 ton model, 138 in.

Steering Gear

The steering gear is of special Velie design—worm and sector type, operated by a

20 in. hand wheel. The center is a complete gear, insuring long life to the steering mechanism inasmuch as the wearing gears can be revolved into four different positions and serve the purpose of four renewals.

The capacity of the gasoline tank is 20 gal. It is 14 in. in diameter and is made from lead-coated steel electrically welded. Approximately 6 miles per gallon is secured with the 3 1/2 ton model, and 12 miles per gallon with the smaller size. A uniform and constant fuel supply is assured by the use of the Stewart vacuum system.

The equipment includes driver's seat and cushion, top over driver's seat, with storm curtains; Stewart vacuum tank, gas headlights and Prest-O-Lite tank, kerosene side and tail-lamps, hand operated mechanical horn, screw jack, tools, oil cans and, in fact, everything.

Velie Specifications

The following table gives the principal specifications of the two models so that they may be compared at a glance:

	Model 25	Model 26
Capacity	4000 lbs.	7000 lbs.
Standard Wheelbase.....	150 in.	172 in.
Optional Wheelbase.....	135 in.	148 in.
Bore	4 1/4 in.	4 1/2 in.
Stroke	5 1/4 in.	5 1/2 in.
Governed Speed	18 m.p.h.	14 m.p.h.
Front Tires.....	36 x 4 in.	36 x 5 in.
Rear Tires.....	36 x 3 1/2 in. dual	40 x 5 in. dual
Chassis Price	\$2250	\$3350

Later in the season, the Velie Commercial Car line will be completed by the addition of a delivery car of 1200 lbs. capacity. This new light truck will have all the features of the larger Velie trucks and will sell at a popular price which will be announced later.

LARRABEE-DEYO TRUCKS IN TWO SIZES



THE Larrabee-Deyo Motor Truck Co., Inc., Binghamton, N. Y., announces two sizes of commercial cars, rated respectively at 1 1/2 and 2 1/2 tons carrying capacity. This truck uses a number of standard parts, such as Continental engine, Fuller transmission, Bosch magneto, Schebler carburetor, Sheldon axles and springs, and David-Brown type worm gear drive.

One and a Half Ton Model

In this model, the engine has a bore of 4 1/8 in., stroke of 5 1/4 in., developing 40 h.p. The speed on first gear is 5 m.p.h., second, 9 m.p.h., and third or direct drive, 15 m.p.h. Tread is 60 in., both front and rear, and wheelbase 132 in. Springs are 43 x 2 1/2 in. front and 50 x 3 in. rear, the tires being 36 x 3 1/2 in. front and 36 x 5 in. rear, solid in both cases.

The overall length of the chassis is 198 in., and width 36 in., weight of the chassis being approximately 3600 lbs. The price of the standard chassis, with seat in priming coat and with full equipment, is \$2000 f.o.b. Binghamton, N. Y.

Two and a Half Ton Model

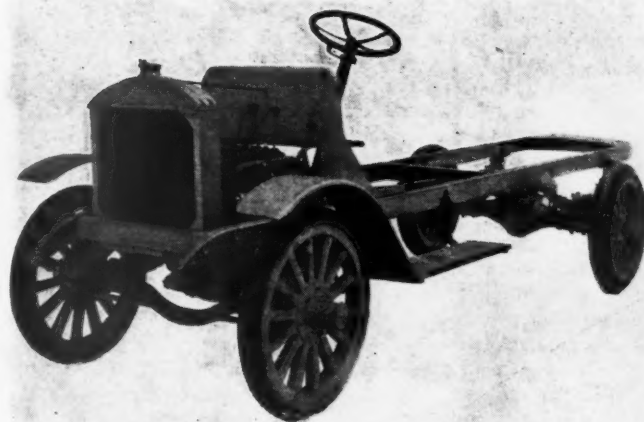
The engine on this model is the same size as the one-and-a-half-ton model. The speeds are 4 1/2 m.p.h. on first, 8 m.p.h. on second, and 13 m.p.h. on third or direct. Tread is 62 in., wheelbase 140 in. standard, or 132 in. or 152 in. special. Springs are 44 x 2 1/2 in. front, 52 x 3 in. rear, tires being 36 x 4 in.

front, 36 x 6 in. rear. The overall length of chassis is 210 in. with the standard wheelbase, the optional wheelbases having a length of 198 in. or 222 in. The width in all cases is 36 in. The weight is approximately 4000 lbs. The price of this model is \$2300 for the chassis, with seat in priming coat and with full equipment.

Details of Both Models

The engine speed is governed by a Pierce governor, which is locked and sealed. Ignition is by Bosch magneto, using no batteries or coils, and the degree of spark advance is available by means of a hand lever. The carburetor is supplied with a hot-air intake with choking device, and the air throttle is operative from the driver's seat to prevent possible stalling in cold weather. The intake manifold is 1¼ in. S. A. E. standard, which enables the purchaser to apply any other standard carburetor, should he have any ideas of his own in this matter.

Transmission is in unit with the engine, eliminating all possibility of the alignment being destroyed by frame stresses. This transmission provides three speeds forward



Front View of Larrabee-Deyo Truck

Showing semi-elliptic front springs, heavy tie rod, worm-drive rear axle and sturdy steering gear

The propeller shaft is of the three-point center bearing type. The center bearing supports the shaft near the middle of its length, eliminating the whipping and vibration. This is a feature which has been

Rhineland double thrust ball bearings. The worm, worm wheel and differential are assembled in a carrier and may be removed as a complete unit, without in any way disturbing the relation of the various parts. Brakes are 16 in. in diameter, with 3 in. face, are easily adjusted and positive in action. Both sets of brakes are full equalized.

The radiator is of the sectional tube and plate construction, rigid in mounting, and unaffected by vibration.

THE ARMLEDER MODEL H-W



THE line of trucks made by the O. Armleder Co., Cincinnati, O., at the present time consists of four models, 2 and 2½ ton chain drive and 2 and 3½ ton worm drive, with a new one ton model under way which will be made in both internal gear and worm gear drive.

The Model H-W 2 ton worm drive has achieved a state of popularity that taxes the factory production to its utmost. This model won favor with Armleder dealers on account of its sturdy yet graceful design and the many exclusive features embraced in its construction.

The engine is made by the Continental Motor Co., with four cylinders cast in block. It is of the L-head water cooled type with a bore of 4⅞ in. and a stroke of 5¼ in., and is mounted on a three point suspension under the hood in front of the dash.

Two independent lubrication systems are provided. They consist of duplicate plunger pressure pump, submerged in oil, with all parts interchanging. The pump drive is positive and direct from the camshaft. The oil is pumped over and over, reaching all the bearings. By placing the oil pumps at the lowest point, in the midst of the oil, it is possible to pump oil continuously on cold days, even if the oil thickens through low temperature. A large dome oil sight glass is supplied on the dash to show that the pumps are working and as further precaution there is located on the crankcase an oil indicator to determine the amount of oil in the crankcase.

Clutch and Transmission

The Brown-Lipe clutch and transmission are standard in this as well as all other Armleder models. They are mounted together in a single aluminum housing which is flange bolted to the engine forming a complete unit power plant. The clutch is the multiple dry disc type that is unaffected by atmospheric conditions. The driving plates consist of six discs ground to a



Larrabee-Deyo Chassis

This is constructed with such standardized parts as Continental engine, Fuller transmission, Bosch magneto, Schebler carburetor and Sheldon axles and springs

and one reverse, and is especially built for heavy commercial car service. The clutch is integral with the transmission and is fully enclosed in the dirt and dust-proof flywheel housing. It is of the multiple disc type and is faced with Raybestos.

largely adopted on European designs and is rapidly gaining favor in this country.

The worm axle of the David-Brown type has imported worm and worm wheels, the former being constructed of steel and the latter of bronze. All thrust is taken by



Armleder Grain Body

Has Continental engine, Brown-Lipe transmission and clutch, Timken-David Brown worm-drive rear axle and full equipment

The CCJ is the only truck publication a member of the Audit Bureau of Circulations. There's a reason!

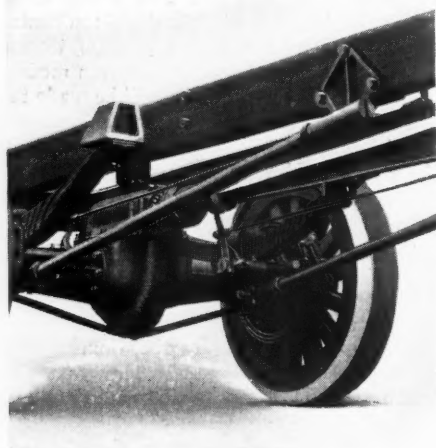
mirror finish, and seven discs lined with a non-burn brake lining, having an indefinite life. The throw-out shaft is machined integral with the clutch housing, so as to maintain perfect alignment. Both ends of the clutch are neatly supported in frictionless bearings.

The transmission is the selective sliding gear type, with three speeds forward and one reverse. Five large Timken adjustable bearings support the shafts. The control is mounted directly on top of the transmission with shifter fingers directly over the sliding, thus eliminating misalignment.

The drive-shaft is made in two sections, employing three one-size Hartford universal joints. The shaft thus shortened increases its strength and prevents liability of whipping.

The Timken-David Brown worm drive rear axle is used. The drive is through radius rods equipped at the front end with ball and socket bearing.

One of the exclusive features on this model is clearly shown in the accompanying illustration. It is the Armleder patented full floating spring with bearing plate, which makes it automatically adjustable to any

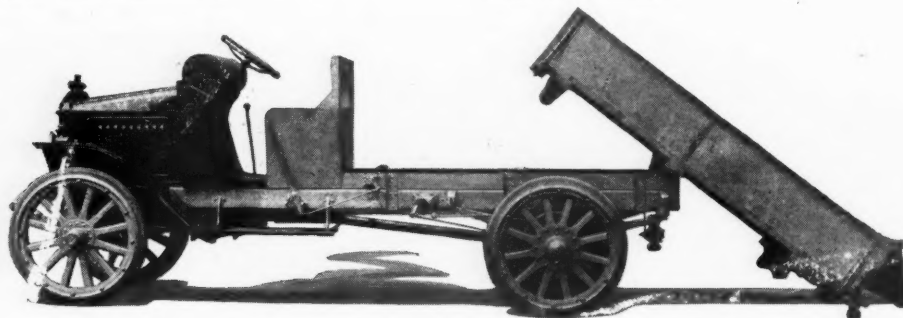


Armleder Full-Floating Spring

This has a bearing plate instead of a shackle and is automatically adjustable to any load, and prevents spring breakage.

load and prevents springs from breaking. This feature does away with spring shackles, bolts, eliminating wearing parts.

An unusually large extra equipment is furnished, consisting of speedometer, two gas head-lights, Prest-O-Lite tank, oil tail-lamp, hand Klaxon horn, jack, and a complete set of tools, and a quantity of small parts for replacement.



Denby Model K With Dump Body

This is the new two and a half ton model, and one price of the above outfit, painted, is \$2365

The CCJ has most readers because it gives most information

The Model H-W is a popular-priced truck, listing at \$2400. The chassis will weigh 4500 lbs. and has been designed with a large factor of safety to take care of the exceptionally severe requirements of its home town, Cincinnati.

Prices of the other Armleder models are as follows: Model HC, 2 ton chain drive chassis, \$2200; Model EC, 2½ ton chain drive chassis, \$2350; Model KW, 3½ ton worm drive chassis, \$3250.

NEW DENBY LINE COMPLETE FROM ONE TON TO TWO AND A HALF TON INCLUSIVE

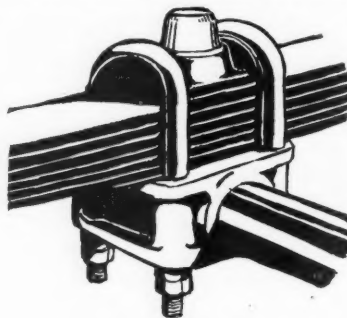


THE Denby Motor Truck Co., of Detroit, Mich., has recently announced that the Denby line comprises 1, 1½, 2 and 2½-ton capacities, at prices ranging from \$1020 for the 1-ton to \$2090 for the largest capacity.

While the same general Denby principles are maintained, the new models possess refinements which make them even more popular than before. Simplicity is a cardinal feature of Denby design, resulting in the proper care of the trucks and dependability. Realizing that in order to be most profitably used a truck must give continuous service, Denby engineers have always kept before them the real purpose of a truck. Each part of the Denby truck is designed to work in thorough harmony with every other part—the result has proved an unusually low cost of operation.

Denby Design

To transmit the power to the wheels with the least loss is accomplished by the combination of a properly built engine, comparatively high engine speed, unit power plant, three point suspension, clutch and transmission mounted on annular ball bearings



Denby Spring Clips

These are heavy bars of nickel steel. Their large diameter prevents stretching and consequent spring breakage.

and the Denby internal gear rear axle. The internal gear rear axle is simple in construction, easily kept in good running order, of comparative light weight, possesses great strength and has a high road clearance.

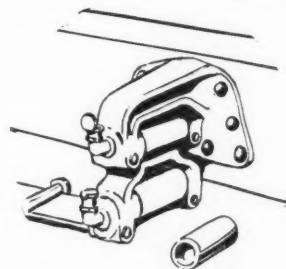
The illustrations appearing here show the location of the gasoline tank on the dash. In this position a constant and uniform pressure is assured under all conditions. The pipe line is short and easily inspected. The gasoline tank can be easily and quickly filled as well as drained. The drain cock is very accessible. Gas tanks are welded, not soldered.

Modifications of chasses and bodies, together with the wide range in capacities, make the Denby line adaptable to the requirements of practically 75 per cent. of the truck buyers.

Model K Specifications

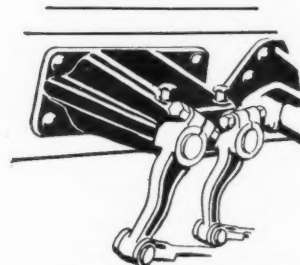
The capacity of this new model is 5000 lbs. and the speed is 14 m.p.h., the weight being 4100 lbs.

The engine has four vertical cylinders, cast in block, 3¾ in. bore and 5 in. stroke. The clutch and transmission form a unit power plant with the engine. Ignition is by means of a high tension magneto, splash



Denby Spring Shackle

All frame brackets are of very strong design, with large bearings all bushed and are lubricated with oil.



Denby Brake Arms

Every point of wear is provided with a bushing and is lubricated with oil, with oilers so placed as to be easily accessible.

lubrication, pump circulated, thermo-syphon cooling, Raybestos faced multiple disc clutch and selective sliding transmission with three forward speeds.

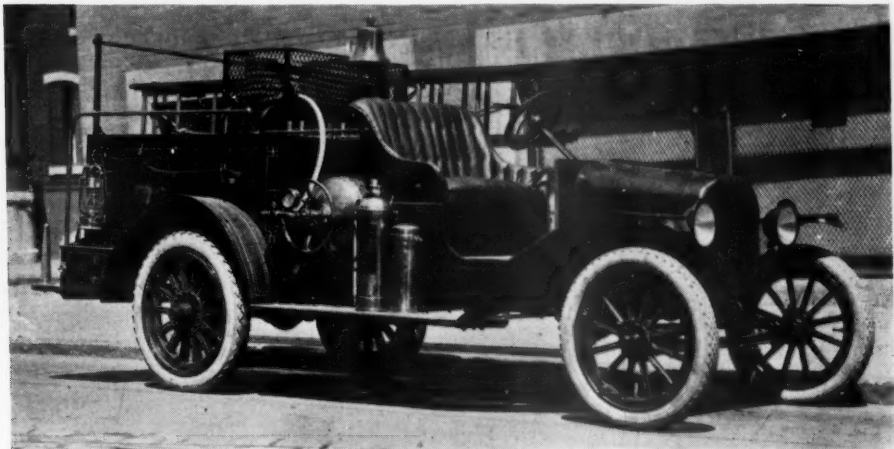
The drive is taken through the springs, frame is pressed steel, 5½ in. deep, ¼ in. stock, front springs 44 x 2¼ in., rear springs 54 x 3½ in., and I-beam front axle.

The rear axle is of the internal gear drive type with the load carrying members 3 in. in diameter. There are two sets of brakes, both located on the rear wheels, 18 in. drums and of military type.

Front tires are 36 x 4 in., rear 36 x 7 in. single, or 36 x 4 in. dual, optional without extra cost.

THE HUDFORD COMBINATION CHEMICAL AND HOSE CAR

The Hudford Co., 1410 Wallace Street, Philadelphia, Pa., has recently placed on the market the Hudford unit combination to the Ford car, this being fitted as a combination chemical engine and hose car.



Hudford Combination Chemical and Hose Car

This is a Hudford unit in conjunction with a Ford car and is completely equipped for the work. The price without including the Ford car is \$1600.

The hose body is of an approved Fire Department design, constructed of sheet steel, forged angle steel frame attached to top and bottom, strongly reinforced and braced throughout. The bottom is of hardwood slats with $\frac{1}{2}$ in. air space for ventilation of hose. The approximate inside dimensions are 47 in. wide by 60 in. long by 23 in. high, and the capacity is 1,000 ft. of $2\frac{1}{2}$ in. fire hose.

The rear step and tool box on each side are of hardwood, suspended from the frame by steel brackets which are rigidly braced by gusset plates, the rear step being covered with corrugated linoleum and bound with metal nosing.

Brass hand rails run the full length of the body and down to rear step, being securely fastened to body by brass stanchions, finished in front with ball ends, and provided with brass flange attached to the rear step, one brass rail connecting rear standard.

The fire fighting equipment includes one wire mesh hose basket, with capacity of 200 ft. of $\frac{3}{4}$ in. chemical hose, mounted on steel forgings over front of hose body, 150 ft. of $\frac{3}{4}$ in. 4-ply special chemical hose in 50 ft. sections, complete with polished brass expansion ring; chemical hose couplings attached to each length is supplied; one $\frac{3}{4}$ in. polished brass chemical shut-off nozzle, with screw tip; one 20 ft. solid side rapid hoist extension ladder, and one 12 ft. solid side roof ladder, with folding hooks, all mounted on side of hose body in strongly reinforced brackets; one 8 ft. pike pole, mounted under ladders on ladder brackets; two polished brass fire department standard lanterns mounted in spring clip holders on side of hose body; two 3-gal. polished copper fire department extinguishers with holders, for mounting

on step each side; one 10 in. polished brass locomotive bell mounted over hose basket; one fire department crowbar, mounted in suitable holders on side of hose body; two hardwood play pipe holders mounted on rear step; one extra acid receptacle, complete with lifter; one polished brass acid receptacle holder, mounted on side

step; one heavy duck soda bag; one filling cap wrench; steel seat upholstered; Hudford fenders; steel box for seat and floor boards. All of the above equipment, except bright parts, to be painted regular standard fire department red. The price of this outfit, complete except the Ford car, is \$1,600.

PRICES OF ACME TRUCKS

We are advised by the Cadillac Auto Truck Co., Cadillac, Mich., that the prices of the Acme models are now as follows:

One-ton model, \$1500.

Two-ton model, \$2100.

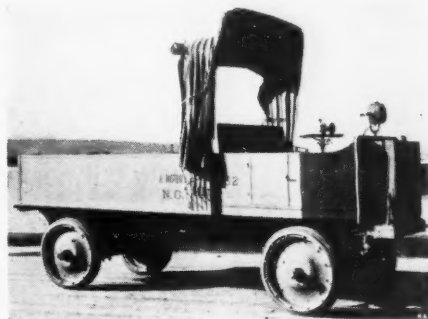
A description of these trucks appeared in our December, 1915, issue, page 25.

MENOMINEE MODELS CHANGED

The Menominee Motor Truck Co., Menominee, Mich., has made several changes in its models for the coming season. The Model E-W, 1500-lb. truck, chassis price, \$1295, is a continuation of the former Model E, with some minor changes. The engine, a Continental, is the same size, having a bore of $3\frac{3}{4}$ in. and stroke of 5 in., developing 25 h.p.

The Model H has a capacity of $1\frac{1}{2}$ tons and the chassis, fully equipped and finished in priming coat, lists at \$1775. This model follows in design the lines of the former models F-W and D. The engine, also a Continental, has a bore and stroke of $3\frac{3}{4} \times 5\frac{1}{4}$ in. Tires are $36 \times 3\frac{1}{2}$ in. front, and 36×5 in. rear. Wheelbase is either 130 or 144 in., at the option of the purchaser.

For complete details and illustrations of Menominee trucks, consult our February, 1916, issue, page 62, in which we fully described the Menominee line.



Jeffery Quad Transport Truck

This truck has been equipped for the First Motor Battery, New York National Guards, recently in camp at Peekskill, by the International Motor Company, West End Avenue and Sixty-fourth Street, New York City. This truck has a tarpaulin over a four-bow top, front bows extending over a windshield, and is used to transport men and supplies.



Copyright by International Film Service

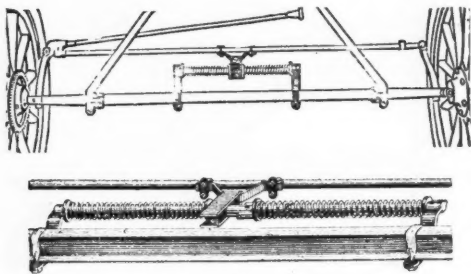
Types of Armed Trucks and Motorcycles in Use on the Mexican Border

Practically all the trucks which have been carrying supplies and troops into Mexico are equipped with machine guns. This is true, not only of the big transportation trucks, but likewise true of many of the motorcycles, which are equipped with rapid-fire guns to repel any possible attack. The cut shows one of the trucks and one of the motorcycles thus equipped.

The CCJ has most advertisers because it gives them biggest returns

ACME STEERING DEVICE

The Acme Steering Device Co., 1225 Filbert Street, Philadelphia, Pa., is manufacturing the Acme Steering Device for Ford cars. This device consists of a pair of coiled steel springs carried on a shaft rigidly attached to the Ford front axle with two clamps. A forked arm piece loosely engages



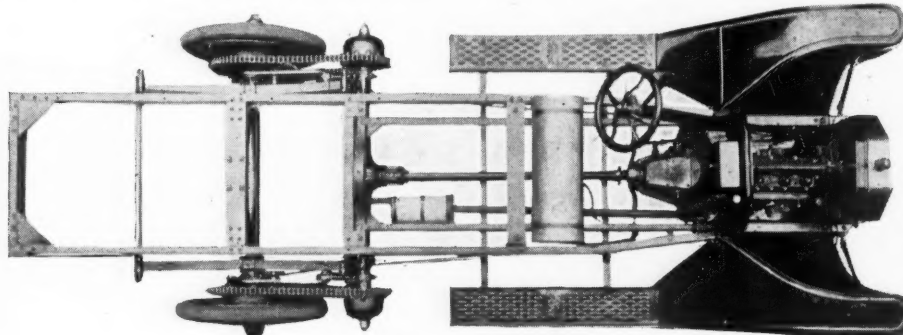
Acme Steering Device

This cut illustrates the method of attaching the Acme Steering Device. The coiled springs have a tendency to hold the car in a straight line, relieving the driver of unnecessary strain.

the coil springs when the car is guided to the right or left. This forked arm is bolted to the tie rod. The maker claims that the device eliminates the possibility of accident in case the steering apparatus should break and it also dispels fear of the wheels buckling when striking an obstruction. In addition it is claimed to effect a saving in tires, joints and bushings because of absorbing shocks. The price is \$3.50.

MAXFER TON-TRUCK-MAKER

The Maxfer Truck Co., 2023 Michigan Avenue, Chicago, Ill., is offering the Maxfer Ton-Truck-Maker, which is described as being a heavy truck frame, which telescopes on the Ford frame. This is carried on heavy side springs and a truck rear axle. Artillery type truck wheels with solid tires and sprockets attached are driven from the Ford rear axle unchanged, acting as a jack-shaft. Specifications are as follows: Axle, heat-treated, $2\frac{1}{4} \times 1\frac{3}{4}$ in. section. Roller bearings on rear axle; rated for 7000 lb. load. Brakes, $2\frac{1}{2} \times 12$ in., internal expanding on rear wheels. Capacity is rated at 2000 lbs. in addition to body. Chains, Baldwin, $\frac{5}{8}$ in. roller, $\frac{5}{8}$ in. wide, 1 in. pitch. Frame, 4 in. steel channel reinforced in four places. Gear ratio 7:1 on high, 18:1 on low speed. Springs, 42 in. half elliptic, 10 leaves. Relief spring 32 in. special, 6 leaves.



Maxfer Ton-Truck-Maker

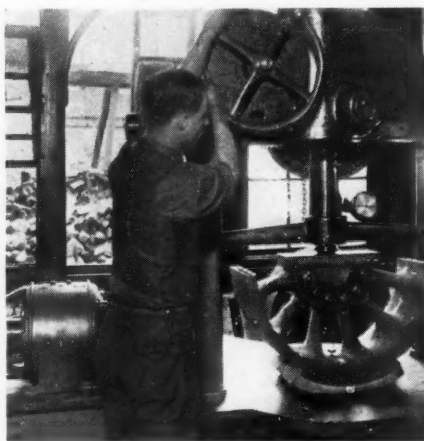
Plan view of the Maxfer unit as attached to the Ford chassis. The maker calls attention to the heavy cross frame members and the bell or offset sprockets.

Tires, $32 \times 3\frac{1}{2}$ in., solid. Weight, including Ford car, 2100 lbs. Wheelbase, 125 in. The feature of this assembly is the offset sprocket, which enables the use of the standard 56 in. tread.

The maker claims ease of attachment and cooler engine operation for this truck unit. The price of the attachment is \$350.

SMITH WHEEL SHOWS LITTLE DEFLECTION UNDER TEST

The accompanying illustration shows half a Smith wheel, made by Smith Wheel, Inc., of Syracuse, N. Y., being tested for resistance power of felloe. The wheel under test was a 36×5 in. rear wheel of central spoke type. It was necessary to cut the wheel in half so that it could be placed under the ram. Had the wheel been whole with pressed-on type of tires on the compression of the arch between, the spokes



Testing the Smith Wheel

The wheel was cut in half, so that it could be placed under the ram. The amount of deflection at various pressures is given in the accompanying article.

would have been considerably less. Under conditions as shown in the illustration results were produced as follows:

	Center of Arch Deflected
From 1 to 5 tons	.002 in.
From 5 to 10 tons	.0045 in.
From 10 to 15 tons	.007 in.
From 15 to 20 tons	.010 in.
From 20 to 25 tons	.014 in.
From 25 to 30 tons	.0175 in.
From 30 to 35 tons	.019 in.
From 35 to 40 tons	.024 in.
From 40 to 50 tons	.033 in.

These loads were applied four different times and each time the deflection showed the same at each pressure amount.

From the above table it will be seen that the various weights so slightly changed the shape of the felloe between the spokes that it is practically a nil factor, way within the elastic limit of the metal, which is not steel, malleable or gray iron, but an alloy which has been produced for over thirty years for certain purposes where strength and resistance against crystallization was highly essential.

Another test was made with one spoke of a front wheel resting on a section of 36×5 in. pressed-on tire, carrying a load of 25 tons. This was all the tire could stand. A number of tests were made of similar sections of a Smith wheel, resting on a steel plate that was cut out to shape of the felloe. Forty to forty-three tons of weight were placed on the section without the felloe showing signs of strain.

A test was also made to determine the amount of resistance against dishing of a Smith wheel which takes 38×6 in. dual tire. The indicator on the pressure gage reached the 50-ton mark. Calipers used between the straight edge and the face of the hub flange surface showed that the distance between had been increased more than 1-32 of an in. by the 50-ton load being placed on the center of the bare hub. After this pressure of 100,000 lbs. was removed the rub returned to original position.

ECONOMY PISTON RINGS

The American Piston Ring Co., 2730 15th Avenue, S., Minneapolis, Minn., is putting out the Economy Piston Rings. They are claimed to always maintain full compression in cylinders because the opening is sealed, thereby preventing the escape of gases and consequently producing the maximum power for fuel consumed. Gray iron is specified in



The Economy Piston Ring

The main feature of the Economy Piston Ring is the specially designed seal employed. This seal is said to effectually prevent oil and gas from leaking past the ring.

the manufacture of these rings, and an alloy is used where the ends join. After the rings are put together on a finishing jig, they are turned and ground so as to make them an accurate circle when inserted in the cylinder. Economy Piston Rings are made in sizes ranging from $2\frac{1}{2}$ in. to 8 in. and are priced from \$.90 to \$2.50.

The Goodyear Tire & Rubber Co., of Akron, Ohio, has issued a catalog of Motor Truck Tires, which addresses motor truck owners and holds forth the advantages of the Goodyear S-V truck tires. Beside the text matter and detailed information there is a list of Goodyear dealers and agencies.



Motor Truck Design and Construction Made Plain Advantages and Disadvantages of Different Types Discussed

By C. T. SCHAEFER, Member Society Automobile Engineers

This is a series of articles by this well-known writer, covering in a non-technical way, the various constructions now current practice in commercial car design. Preceding articles covered General Types of Chassis, Two and Four-Cycle Engines, Types of Cylinders and Their Parts, The Valve-Operating Mechanism and the Crankcase, Engine Lubrication, The Engine Cooling System, Carburetion and Carburetors, High-Tension Magnetos, Low-Tension Magnetos and Battery Systems, Inductor Magnetos, Governors and Speed-Controlling Devices, Clutches, Unusual Features of Design, Transmissions, The Universal Joint and Differential, The Final Drive, Front and Four-Wheel Drives, Brakes, The Front Axle, The Steering Gear, The Frame, Power Plant Arrangement and Its Mounting, Springs and Suspension, Motor Truck Wheels, The Muffler, The Fuel Supply System.

PART XXV CONTROLS

THE controls of a commercial car consist of the following: the spark, throttle, clutch, change gear lever, brakes and the steering gear.

The most important controls are the spark and throttle. The former may either be hand operated from the steering wheel, it may be so arranged as to cause ignition to occur at a predetermined point or it may be automatically controlled by the engine speed. The throttle may either be controlled by the driver or automatically. There are two means of manual control, by hand or foot. Automatic control was described in the chapter on governors.

The conventional type of control for cars with sliding gear transmissions, comprises two pedals located on opposite sides of the steering post, the one at the left being the clutch pedal and the one on the right the brake pedal. The foot throttle or accelerator, if one is provided, is placed either between or to the right of these pedals for operation with the right foot. The mounting of these pedals depends upon the general construction of the vehicle. When a unit power plant is used they are generally mounted on the clutch housing; if the transmission is mounted amidships the common plan is to provide a tubular shaft extending partly or entirely across the frame, which is carried in brackets secured to the frame. Formerly the steering column was nearly always placed on the right side of the car, and the hand levers for operating the sliding gears and the emergency brake were located just outside of the driver's seat on the right. However, during the past few years, quite a few makers have resorted to the left side drive in which the steering column is located on the left side and the levers either on the left side or in the center.

On several makes of vehicles the clutch and service brake are operated by a single pedal. The first motion of the pedal releases the clutch and a continued motion

applies the service brake. The emergency brake may also be operated by a pedal; however, it must be provided with a ratchet lock. The brakes and clutch may also be connected through suitable linkage so that when either brake is applied the clutch will also be disengaged. The idea which led to this construction undoubtedly was that if the driver wants to stop quickly he should

erally so arranged that the gears cannot be shifted unless the clutch is cut, and the clutch cannot engage unless the gears are in full mesh.

Left vs. Right-Side Control

The advantages and disadvantages of the two control positions may be divided into general and mechanical. The advantages of one, are, moreover, usually the disadvantages and advantages of the other, so the question may be discussed for one only. The two essential features of the left side control are: first, greater ease in getting out of the vehicle on the right side, and second, the bringing of drivers meeting vehicles next to each other, thus lessening the dangers of collision.

The first is of importance only as regards convenience of both operator and helper. The second point is well worthy of consideration, as when two vehicles meet on narrow streets or roads, the distance between the two must be judged with great

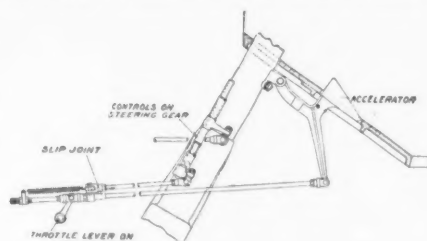


Fig. 1. Pierce Foot Throttle

The accelerator is hinged to the steering column and connected to the carburetor throttle lever by a rod which carries a slip joint.

simultaneously disengage the clutch and apply the brake, so that the driving effort ceases and no braking effort need be expended in dissipating the energy stored in the flywheel.

In order to prevent shifting of the gears while the clutch is engaged, some designers have provided an interlock between the gear sliding and clutch mechanism. This is gen-

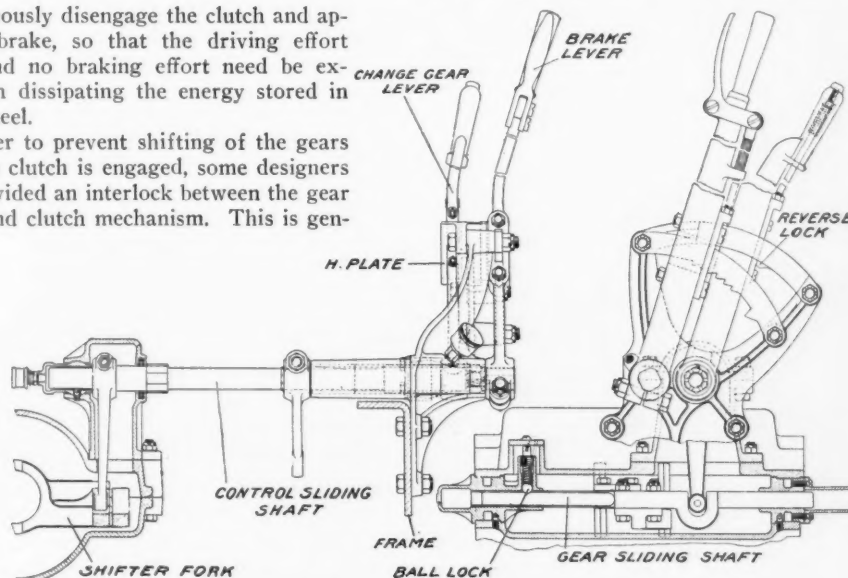


Fig. 2. Pierce Selective-Type Control

This is the five-ton control and is mounted on the right side rail of the frame as the controls are arranged for right-side drive

nicety in order to prevent scraping mud guards or bodies and locking wheels. The disadvantages are the difficulty of judging the distance from the curb, the distance of an overtaken vehicle and in some cases the difficulty in mounting the control levers. The first claim seems to be a difference of opinion, as there are some who claim one is no more difficult than the other. However, if the distance is not judged properly the tires will suffer, not mentioning the strain imposed on the wheels, axles and steering knuckles in striking curbs.

In overtaking vehicles the driver is on the left side, and farthest from the overtaken vehicle, and this would seem to be offset by the advantage of bringing the operators of meeting vehicles next to each other, but a close study seems to point in favor of the right side control, for in the case of meeting vehicles two operators are watching and able to judge distance, while in overtaking vehicles there is only one who can judge the distance.

The mechanical points relate to details of design and apply to each type, however the center control offers an advantage in that the gear lever can be mounted directly on the transmission, thus doing away with superfluous connections.

Spark and Throttle Controls

Various types of these controls were illustrated in Chapter XVIII describing the steering gear. The general practice is to incorporate these in the steering gear, while the foot throttle or accelerator consists of a small pedal mounted on the dash or foot board and connected with the hand throttle in such manner that it can be operated without changing the position of the throttle lever on the wheel. This is accomplished

by a slip joint, as shown in Figure 1. The accelerator is hinged to the steering column and connected to the carburetor throttle lever by a rod which carries a slip joint. This joint has an extension to which the hand throttle is connected. The accelerator is normally held in the off position by a coiled spring.

Another type of accelerator was illustrated in Figure 2, Chapter XVIII, showing the Reo steering gear.

The advantage of the foot throttle is that it permits the operator to control the speed of the engine with his right foot, thus leaving his right hand free to change gears, and the left to steer the vehicle. The advantage of quick gear-shifting is not to be denied, as anything which tends to reduce engine racing, gear clashing, etc., is quite desirable. However, motor trucks operate on solid tires and the floor boards are constantly vibrating, and all of the minor shocks which the vehicle springs do not absorb are transmitted to the cab. This vibration makes it quite difficult for the operator to keep his foot steady, as the slightest movement of his foot acts directly upon the throttle. Sudden acceleration is another disadvantage which is to be avoided.

The hand throttle of course eliminates this, and it is also possible to hold it stationary on the quadrant. Disadvantages of the hand throttle, besides the inconvenience in

changing gears, includes the danger of shifting gears without throttling down the engine.

Brake, Clutch and Gear-Shift Controls

There are two general types of pedals, the straight and the bent type, both of which are illustrated. These pedals have to pass through the floor boards and their shape is dependent upon the room available. They may either be drop forgings or steel castings, and vary from 10 to 16 in. in length, depending upon the required leverage.

Brake and change gear levers are generally drop forged of I-beam section, and in most cases pivot from a common pivot axis. The change gear lever of selective type change gears moves in an "H" segment or gate and does not require a latch to hold it in position. However, a lock is sometimes provided to obviate the possibility of accidentally engaging the reverse gear. A latch lever must always be used with a progressive gear control, and the emergency brake lever must also be provided with a latch. There are two general types of selective gear controls which are termed

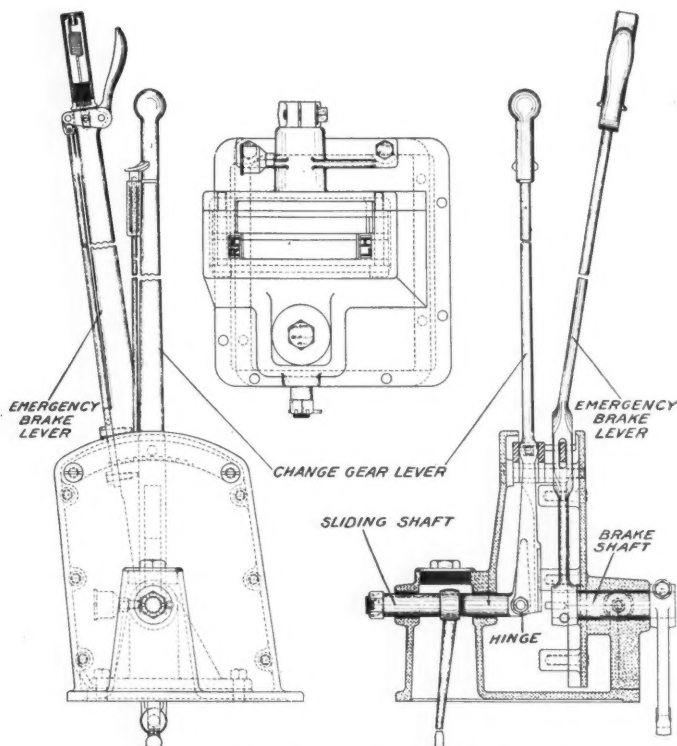


Fig. 3. Brown-Lipe Center Control for Unit Power Plant Transmissions

This differs from the one shown in Fig. 2, in that the control lever is hinged to the sliding shaft and pivots in a rectangular-shaped quadrant

The CCJ is the only truck publication a member of the Audit Bureau of Circulations. There's a reason!

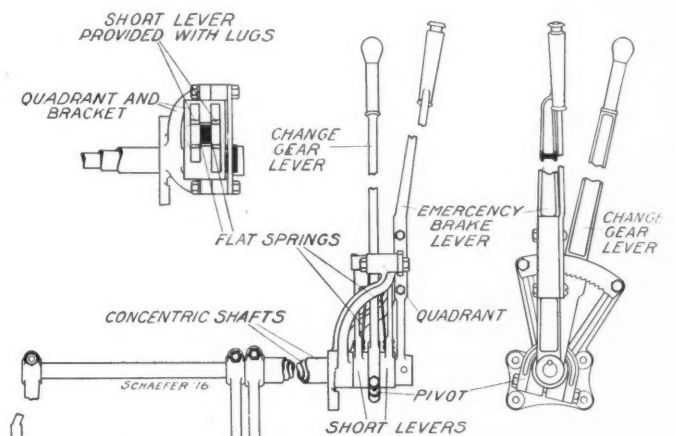


Fig. 4. Swinging-Lever Type of Control

This is designed for right-side control and frame mounting. The change-gear lever is pivoted to a hub which is free to turn on the control shafts.

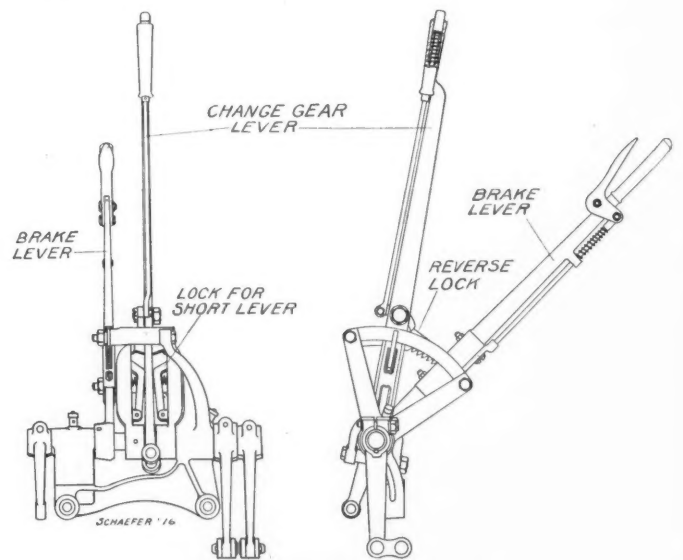


Fig. 5. Warner Swinging Lever

Control arranged for center control with right-side drive. This type shows a difference in the method of engaging the control lever with the short levers that turn the concentric shafts.

the sliding shaft and swinging lever types. While all controls may be classified under these two heads, there are numerous variations in detail.

Sliding Shaft Control Set

The Pierce 5-ton control set, Fig. 2, is of this type and mounted on the right side

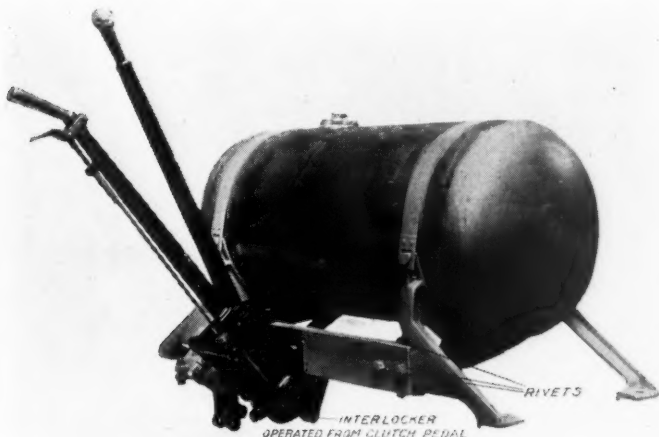


Fig. 6. United States Center Control Mounting

This shows how the gasoline tank support also acts as the support for the control

rail of the frame, as the controls are arranged for right side drive. This selective gear control comprises a sliding shaft to one end of which the control lever is rigidly secured, and which at its inner end carries a downwardly extending arm which is arranged to engage with a semi-circular slot in one or the other of the sliding shafts of the transmission which carry the gear shifting forks. The sliding shafts are provided with ball locks, which help to find the correct mesh, and also prevent shifting of both shafts together. The H plate or quadrant, which guides the lever in shifting to the various speeds, is placed slightly forward of the emergency brake lever and has a lock controlled by thumb latch on the lever handle for locking out the reverse gears. The gear shifting mechanism also has a lock which prevents shifting gears until the clutch has been disengaged. This consists of a semi-circular cam or segment keyed to the sliding shaft of the control set and a plunger connected with the clutch pedal, which, while the clutch is engaged rests in holes in the cam surface. To shift gears the clutch must first be disengaged, which also disengages this plunger. The emergency lever is of the spoon latch type which releases a lock fitting into the ratchet teeth of the brake quadrant.

Another type of sliding shaft control is shown in Fig. 3. This is furnished by the Brown Lipe Co. with their transmissions

for left side control, and is used on a number of commercial cars. This differs from the one above in that the control lever is hinged to the sliding shaft, and pivots in a rectangular shaped quadrant. Instead of the lever sliding with the shaft, it pivots to either side in the quadrant and moves the shaft in the opposite direction to which the lever is moved. The emergency brake lever has a spoon latch which operates on the conventional ratchet quadrant, and is pivoted from the same center as the gear lever but its shaft extends to opposite side of the housing, which encloses the entire control. This type of control is intended for unit power plants where the transmission usually is located under the foot boards.

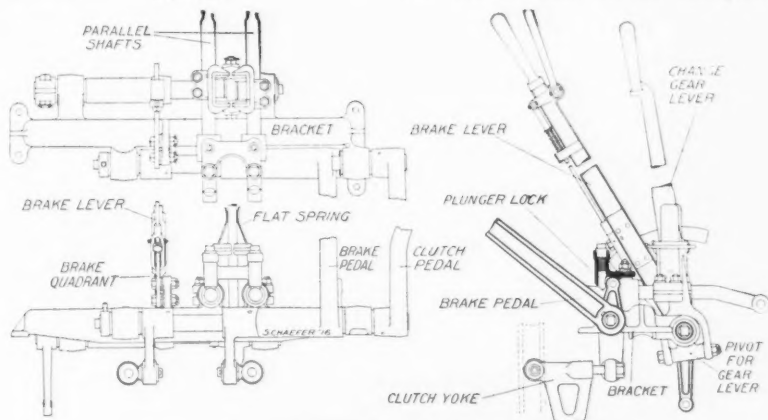


Fig. 7. Center Control and Pedal Mounting of Flint Delivery Cars

The control lever is of the swinging-lever type, but instead of using a quadrant and concentric shafts, the short arms are connected with two parallel shafts which are provided with plunger locks.

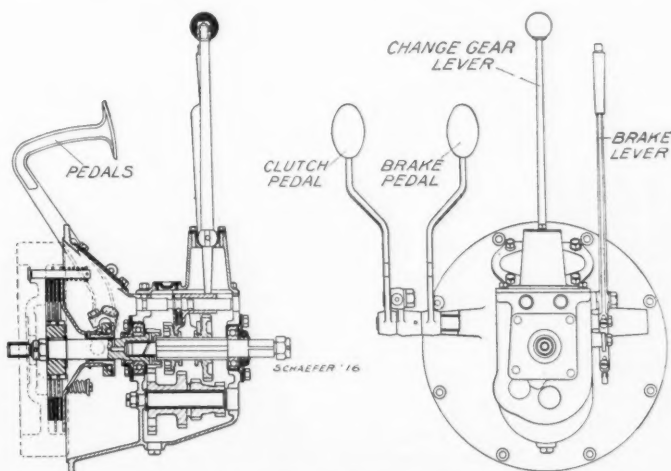


Fig. 8. Conventional Control Mounting for Unit Power Plants of Light Delivery Cars

The swinging control lever, instead of being pivoted at its lower end, has the pivot, which is of spherical shape, a short distance from its end and rests on a bracket.

The Swinging-Lever Type

A swinging lever type of control used on several cars is shown in Fig. 4, and is designed for right side control and frame mounting. The change gear lever is pivoted to a hub which is free to turn on the control shafts. On each side of this lever are short levers which are fastened to concentric control shafts, each of which extend to the inside of the frame and carry operating arms. These arms are connected to the sliding shafts of the transmission by rods and clevises. The upwardly extending levers are provided with lugs, between which the control lever engages when it is pressed in the direction of the particular short lever. Same provision must be made for holding the change gear lever in a neutral position, and this is accomplished by the two flat springs fastened to the short levers. When the control lever is moved in one of the slots of the quadrant it is connected with one of the short levers and turns the shaft to which that lever is secured.

Fig. 5 illustrates another type of swinging lever control which was introduced by the Warner Gear Co. for unit power plant

mounting. It differs from the above in the method of engaging the control lever with the short levers that turn the concentric shafts. These have small arms hinged to them, which are held in contact with the control lever by spiral springs. The pivoted arms have a lug which engages in a slot in the quadrant and locks each shaft in position. This type of control eliminates the danger of turning both shafts at the same time. It also incorporates a reverse lock controlled by a thumb latch on the control lever.

Center control may also be employed with the transmission located amidships or on the jackshaft. An excellent example of this is shown in the United States control, Fig. 6, in which the support for the gasoline tank is used to support the control.

Center Control and Pedal Mounting

On the Flint delivery cars the center control and pedal mounting is incorporated

in a single unit supported from the sub-frame as shown in Fig. 7. The control set is of the swinging lever type, however, instead of using a quadrant and concentric shafts, the short arms are connected with two parallel shafts which are provided with plunger locks. The short levers instead of pivoting from the center of the control lever, slide with the shaft. This construction permits placing the sliding shafts in the transmission directly above the gears, making a direct connection and eliminates the trouble usually experienced with bent connections.

A large bracket extends from one sub-frame member to the other and has bearings at its rear end to support the control and brake lever, while bearings are provided at the front end for the pedals and their shafts. The service brake connection is made from a small lever cast integral with the brake pedal while the clutch is connected to the pedal through a yoke and levers, keyed to the shaft. The brake pedal is interconnected with the clutch pedal so that in applying the brake the clutch will also be disengaged.

Fig. 8 depicts a unit power plant transmission with center control and pedal mountings for left side drive. The swinging control lever instead of being pivoted at its lower end, has the pivot, which is of spherical shape, a short distance from its end and rests on a bracket incorporated with the transmission cover. The end of the lever engages with the shifter forks in the transmission which have lugs that straddle the lever. This makes a very simple control and eliminates a number of parts. The emergency brake lever is mounted at the side of the transmission and is also pivoted a short distance from the end. The lower end has a connection for the brake rod and a slot through which the quadrant is inserted. The pedals are mounted on an extension of the clutch disengaging shaft. Both of these are free on the shaft, but the clutch pedal is connected to a sector which permits pedal adjustment to take up the wear of the clutch.

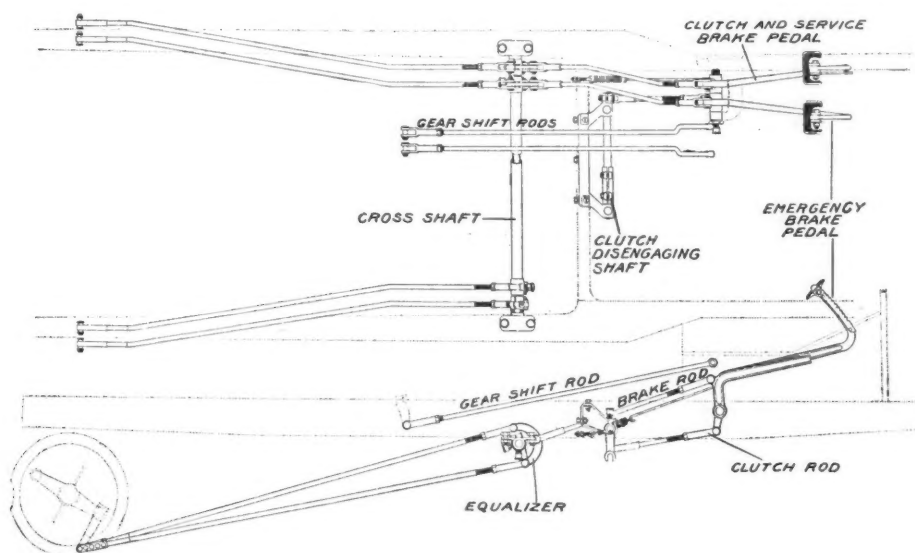


Fig. 10. Natco Brake Rod and Pedal Arrangement

The engine on this model is located under the hood and the linkage consists of rods throughout

The CCJ has most advertisers because it gives them biggest returns

Progressive Type Control

In the progressive type of transmission it is necessary to progress from one speed to another and for this reason it is necessary to provide a control which has a lock for each speed and the neutral position. The Mogul heavy duty trucks are equipped with a progressive type transmission which is built in a unit with the jackshaft, while the operator's seat is placed over the engine. This makes it difficult to arrange a neat

lever near its pivot end, while the other end is connected to the sliding shaft.

Brake Linkage

Unless the braking force applied to the rear wheels is equalized, that is, that brakes on opposite sides produce equal retarding forces, the car has a tendency to skid and brake adjustment is also quite difficult. This necessitates an equalizing device in the brake operating linkage, which will apply an

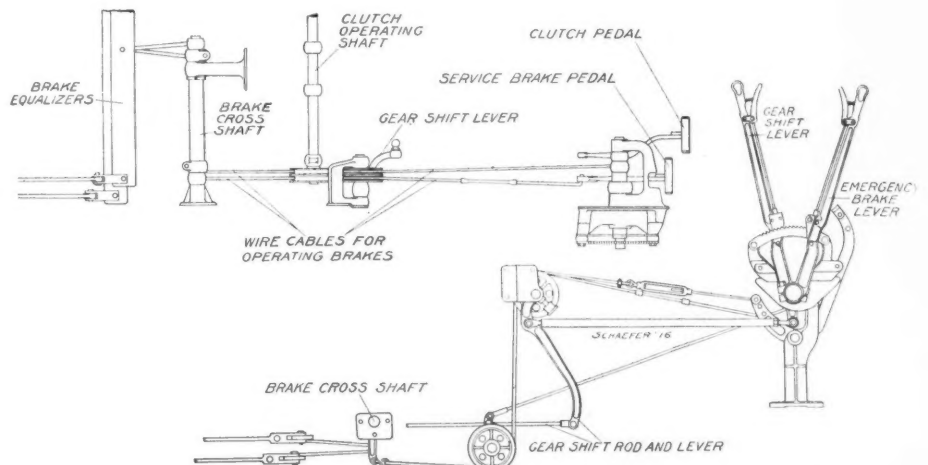


Fig. 9. Mogul Brake, Clutch and Progressive-Type Gear Control

The pedals pivot from a center common to both, but this is somewhat below the center of the levers

control; however, in the Mogul trucks the control levers and pedals are supported from a single bracket. Both gear and brake levers pivot from the same center and are mounted upon concentric shafts. Since a lock is required for both levers, these are equipped with spoon type latches. The pedals also pivot from a center common to both, but this is somewhat below the center of the levers as shown in Fig. 9.

The position of the control levers also makes it difficult to obtain a direct connection to the sliding shaft in the transmission. In this case it is quite simple as an extra long lever is pivoted from the seat support which connects with the control

equal retarding effect to the two brakes of each set. This equalizer is dependent upon the general scheme of the linkage and in most cases is of the whiffletree or modified whiffletree type. The brake linkage is dependent upon the general layout of the chassis.

With the seat mounted over the engine, it is necessary to arrange this so it will provide maximum accessibility for the engine and Fig. 9 illustrates how this is accomplished with wire cables on the Mogul trucks. Short rods are connected with the brake pedal and lever and carry turnbuckles which are attached to wire cables. These cables pass over pulleys mounted on the seat frame and the clutch disengaging shaft. They connect with a cross shaft, which in turn is connected with equalizers of the whiffletree type. From these equalizers, rods and clevises form the connections to the brake. The clutch connection is made with a rod direct from the pedal to the clutch disengaging shaft which is supported from the sub-frame.

On the Natco trucks, Fig. 10, the engine is mounted under a hood and the linkage consists of rods throughout.

The pedals are supported by a bracket attached to the frame, while a cross shaft is arranged to incorporate an equalizer for each set of brakes. The clutch pedal also operates the service brake, while the brake pedal has a ratchet which locks automatically and is released by tipping the pedal pad. The brake equalizer is of a modified whiffletree type and is mounted vertical instead of horizontal. An equalizer, which is a modification of the bevel gear differential, is used on the United States trucks, and was described in the chapter on "Unusual Features of Designs."

The Motor Truck

Extracts from a paper presented by H. L. Wittemore, Advertising Manager of the Autocar Company, before the National Team and Motor Truck Owners' Association, June 27, 1916, St. Louis, Mo.



THAT the motor truck is one of the very important factors in the express and hauling business needs no comment here—the very fact that at your last convention the name of your organization was changed from “The National Team Owners’ Association” to “The National Team and Motor Truck Owners’ Association,” is evidence enough of the place the motor truck has made for itself among you.

The manager of one of the nationally known express companies has pointed out that most of the epoch-making inventions that have made big business possible were when first invented regarded as luxuries—the sewing machine, gas and electric light, the telephone and telegraph—these all for a very short time were used by the rich to displace the older methods that the masses had to cling to; but each of these in short time was used to serve business and to put business on the plane of efficiency it now stands. So it was with the automobile—at first the rich man’s luxury, it soon became the public’s servant. This same manager said that the prime factors in the express business are expedition and efficiency; that is to expedite the carriage of packages from shipper to consignee in the most efficient manner. It was natural then that the express men should have been among the first to adapt the swift and untiring automobile to their business, and it is not to be wondered at that the express interests are the largest users of motor trucks in the country.

It is hard to try in any paper to give the cost of motor truck operation—that varies so radically, dependent on so many conditions that actual figures are bound to be misleading. The size of the vehicle, the kind of route it covers, the care that it receives, the loads it carries, all enter into the cost of operation. The fact is that we have found it poor sales policy to try to say what it will cost to operate a motor truck unless we know with some degree of certainty what all the conditions are under which it will run.

We have found that the cost of operating an Autocar under average conditions is approximately \$7.62 per fifty-mile day. In arriving at this figure we put the first cost of the car at \$1,850 (\$1,650 chassis and \$200 body) and allow for fixed charges or depreciation, interest and insurance; and operating expenses of tires, gasoline, oil and repairs. We also include a driver at \$2.50 per day.

This figure, while it does not compare unfavorably with the cost of a two-horse team, should not be compared with that cost, but rather with the cost of horse equipment that would be necessary to do the same amount of work. We have a general saying that an Autocar at very much less cost than two teams will do the work of three.

It must be borne in mind that this figure is an average taken from the performance of many trucks under many different conditions, and that the performance of any one truck may be either lower or higher. It must also be remembered that this figure is worked out on the records of one make of truck only—the Autocar.

The one statement that practically every motor truck user among express and haul-

ing concerns makes is that motor trucks make it possible for them to do work and take hauling contracts that were an absolute impossibility with horses. Your business differs from so many others in that instead of taking a definite thing to a definite place, you take anything anywhere; and your business grows to your advantage in so far as you can take more different things to more different places with profit. Another big distinction between the hauling problem in your business and in many others is that with you the hauling is the whole business, with others it is a side line that must be figured in as such.

It may be of interest to find out what some of your fellow business men mean when they say that the motor truck opens up opportunities that did not exist to the horses.

Two Classes of Jobs

These jobs that the motor truck has made possible can be roughly divided into two classes: jobs that must be done in such short time that horses are out of the question, and jobs that cover a distance so great as to be impractical for horses. The first kind of work may be called “special service,” the second “new business.”

This “special service” feature is a tremendously important asset to an expressman’s business. As a rule it is well paid for, and invariably it creates a good will towards the company that renders the service that is the most substantial advertisement a man can buy.

Wandering around in different cities, a good many instances of this “special service” have come to our attention. Last January the writer was talking to Freeman Landon, of the F. Landon Cartage Co., Chicago. He mentioned a stunt that one of his Autocars had done just a few days before. A man called up at 4.48 P. M. to make a delivery at the Illinois Central before 5.30. The Autocar traveled over 5 miles, picked up the goods and delivered them on time. “That,” said Mr. Landon, “is the kind of service people don’t forget; the fact is, we consider our trucks the best solicitors we have.”

Mr. Sheahan, of Philadelphia, your secretary, is an Autocar owner who often has a chance to send his truck out on a “special service” trip. One of his big customers sent in word that a rush shipment had to reach a point three miles from their plant by 2 o’clock that afternoon. Mr. Sheahan located his truck by telephone over in Camden, N. J., the load was picked up at a quarter to one and in seventeen minutes was at its destination. Work like that is of course out of the question for horses, and the situation must be faced that the more of this kind of service truck owners render, the more it is demanded.

Motor Trucks Open Up New Business

The new business that motor trucks open up is exemplified in every city and town in the country. An Autocar owner in a small New Jersey town recently wrote us a description of the work he is doing with his truck. He bought the Autocar about a year ago to carry the mails between the post office and the railroad station. Now he has a contract to deliver for one of the big express companies, and to carry the children to and from school; besides this he often is

called on for long distance moving jobs and many a time in the evening he carries picnics and straw rides. He bought his car on time payments, and with it has earned the money to meet his notes and make a living besides. Within the year this man says he has doubled his income.

The big Philadelphia express concern that operates from Front Street to certain New Jersey towns beyond Camden is now operating two trucks and four horses in place of the twelve horses they formerly owned. The average run for this company is only six miles from Philadelphia; a truck regularly makes two round trips each day and sometimes three, whereas a two-horse team never made more than one. This does not sound like a great deal of work until the conditions are fully understood; the trucks have to be loaded in town, cross the ferry and make numerous stops all along the route.

Another man who covers an 18-mile route out into Jersey often makes two round trips each day with his Autocar; it is not seldom that his truck turns over a daily mileage of 100 miles. This man said to the writer, “I can’t use horses, the man who had the business before me used to leave for the day at four in the morning and not get back until eight at night. He made one trip only and had no time for pick-up calls; I have plenty of time for two round trips.”

It would be a simple matter to multiply these instances a hundred fold, but we who are in the motor truck industry have come to almost take it for granted that the expressmen believe in motor trucks and have only got to be shown which truck is best suited for them. Motor trucking has come to be the standard method of hauling—last January *The Outlook*, in an article appearing in their Department of Industrial Progress, said that a count made of delivery vehicles at the intersection of two of New York’s most crowded streets during one crossing of north-bound traffic showed that of forty-six delivery vehicles, forty were motor driven.

Before going any farther there is one phase of motor truck use that I would like to touch on. There is no doubt that in order for a motor truck to earn its maximum it must be kept on the go all the time. Some men have become so impressed with this fact that they refuse to consider a motor truck for any short haul work. I think that what might be termed “business insurance” is a consideration that applies here. Further than that I believe the difference in cost between a motor truck and horses on this short haul work is often overestimated.

I have just used the term “business insurance” by which I mean the fact that, although the largest part of a man’s hauling may be short haul work, there are always occasional times when with a truck he can do a long haul job that may be very profitable to him, and open up to him new fields.

Figuring on the same basis as we did a few minutes ago in finding the average cost of Autocar operation for fifty-mile day, we find that for a ten-mile day an Autocar would average to cost \$4.95. This as before includes fixed charges and operating expenses including a driver at \$2.50 per day. You gentlemen can supply figures for a two-horse team to compare with this better than we can, but we do submit that the cost of

an Autocar on this ten mile day compares favorably with the horses, and the big fact remains that the motor truck always stands ready to accomplish what is for horses the impossible.

Considerations in Purchasing a Truck

In purchasing a motor truck there are several things that should be taken into consideration. Of these the most important are:

1. The stability of the manufacturer and the service that stands back of the truck.
2. The capacity best suited to your business.
3. The most advantageous terms for you personally to buy on.

These three points should be considered separately.

It is all important to buy a motor truck from a reliable manufacturer (this is of course true in purchasing any equipment) and in the motor truck field this reliability is reflected by what in the trade we call "after sales service." In speaking of after sale service I am simply going to outline in a very brief way the policy of the Autocar Co. Autocars are not sold in every city of the country—some of you gentlemen may know the Autocar better than any other truck, others may not yet be familiar with it. Autocars are sold for the most part in and near the centers where our own factory branches are established or where we have an agent who can give service up to our factory branch standard.

This service consists of inspection of cars, an unfailing supply of repair parts, and an efficient force of repair men thoroughly familiar with Autocar construction. It is our belief that it is far more to our advantage to spread out our sales conservatively as we can extend our service to protect them than it would be to sell indiscriminately and run the risk of having some dissatisfied users.

You gentlemen cannot be too careful in making sure of the protection to your motor truck investment and that can only be insured by service from the manufacturer. You may save a few dollars in initial cost by buying an unknown car, but those few dollars will soon be eaten up and a large loss shown on your books if your truck is held up waiting for repair parts.

As to the capacity of truck best suited to your business, that is of course dependent somewhat on conditions, but we have found that by and large in general express and hauling the 1½-2-ton truck is the car of general utility. The truck of this capacity is not so expensive to operate but that it pays with fairly light loads, yet it is so much more mobile than the heavier truck that it can reach out farther and more quickly.

A motor truck on the other hand is business equipment, from the operation of which money is made, and time and again a motor truck when paid for partly by interest bearing notes earns the money to pay for itself.

Very often we are asked, "What is the life of a motor truck?" This of course depends on so many things that one answer cannot suffice. For bookkeeping purposes we advise writing off 20 per cent. of the cost of the car each year as depreciation. Hundreds of Autocars have been in service well over five years, but by writing off one-fifth of the cost each year the value either in cash or in service after that time is velvet.

Overhauling

It pays to have a motor truck thoroughly overhauled after a few years' service and to have it examined much oftener. We do not advise frequent trading in of cars, for we believe that a complete overhauling, or, if necessary, a rebuilding, will give you more value at less money. A motor truck is not

like a pleasure car, if your old motor truck will haul efficiently it is a matter of small moment to you what refinements have been put on more recent models. When you trade in you take the depreciation that may arise from new models and you stand a chance also of a depreciation due to a reduction in price since your original purchase.

In conclusion I would like to say that, while the future of the motor truck business looks bright when viewed from almost any angle, there is no one thing that makes the motor truck manufacturer more optimistic than the wonderful way in which you, to whom hauling means bread and butter, have adapted the motor truck to your ends. That the motor truck is increasing your earnings and easing your burdens goes far to convince us that the motor truck business is thoroughly worth being in.

FINDING A SECOND-HAND TRUCK MARKET

By FRANK FARRINGTON



YOU must find it mighty unprofitable," I said the other day to a dealer who was pushing commercial cars, "to take the old trucks in trade. There are lots of users now who have old cars to trade in."

"So far," he replied, "I haven't had any trouble finding a market for the used trucks and I'll tell you where I have been selling them."

He went on to explain the markets he had found for old trucks and it may be his experience has not been just that of the average dealer.

The first opening he found was among junk dealers. Don't understand by that that he was unloading the old trucks for their value as scrap. Nothing of the kind. He found junk dealers throughout the section using pretty tough looking horses and wagons for gathering up their purchases, and knowing a junk dealer would always make a man an offer of some kind on practically anything, he went to these fellows when he had a truck he could sell cheap, and made them an offer—or sometimes got them to make an offer. The result was that he soon had practically every junk dealer in his territory, to say nothing of some outside his territory, using trucks.

This feature of the plan did not stop there, because he soon found that every-one of these junk dealers, and he encouraged the idea, was a sort of sub-agency for his used trucks. Each such purchaser would work over the old truck, probably adding to it something in the way of equipment, and sell it at a profit and come back for another for himself.

Sells to the Country Peddler

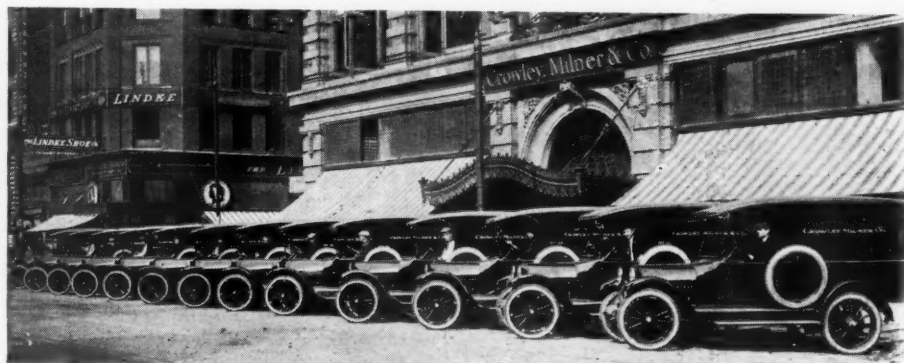
Another market he has found available has been peddlers of the sort who sell through the country districts in the style of the old-fashioned tin peddler. These people and the country merchants who send wagons out among the farmers, have been good buyers of second-hand trucks. They cannot make a large investment. They do not count their time worth much and so are willing to take almost any truck that has an engine that works all right.

Something of a sale he has found, too, among progressive farmers who have use for a gasoline engine in such ways that they can use the motor power in the truck. Trucks with pretty good working engines but without suitable chassis, or with broken down running gear, have sold time and again to a man who would buy for the stationary use to be got out of the engine.

He keeps a demonstrator hitched up in the garage showing how power can be developed from the truck engine.

If a farmer can use his truck to develop power for his milking-machine, separator, buzz-saw or churn, he is that much more likely to buy.

At least once a year this dealer has a second-hand truck sale when for a few days he shows an assortment of the trucks he has to offer, holding it at the time when he has the most stock. He makes special spot cash prices that are attractive on the whole lot. He writes personal letters to the people he wants to interest and he sends out announcements of the event and does everything he can to get a good attendance. Once when he had a considerable stock of the used trucks, he made a feature of decorating the garage and holding a regular show, with the local brass band to furnish music one afternoon.



Department Store Buys Fleet of Studebaker Trucks

A fleet of fifteen half-ton Studebaker commercial cars which have just been placed in service by Crowley-Milner & Company, Detroit's big department store. The original installation consisted of four machines. On the strength of the service given by these, fourteen brand new trucks of the same capacity have just been added. Crowley-Milner & Company are using Studebakers exclusively for work of a light hauling nature with the exception of some horse-drawn wagons which are rapidly being disposed of.

Mosby Solves the Used-Truck Problem

By LEN G. SHAW



MOSBY bit the end off his cigar as easily as though the amputation had been performed by a steel trap instead of the jaws that came together with a snap:

"It's a rotten deal, just the same," he expostulated.

"Well, what are you going to do about it?" retorted Reynolds. "Slocum has offered the Miltex Company \$500 for that old truck—and if we don't meet his figure the Miltex people will give Slocum the order—and we've got to get their business, that's all there is to it."

"That old rattletrap of a truck isn't worth over \$250," Mosby went on, biting off another generous section of his cigar and blowing it half way across the office.

"I know it," admitted Reynolds, rather lamely, "but with our commission on the new truck we'll break even on the deal, at least, and maybe we'll find somebody we can unload the junk on so that it won't be such a bad deal."

"If Slocum had only kept out of it, instead of butting in like a crazy man, and making such a ridiculous offer."

"But he didn't keep out, so we're up against it. And we've got to hold that Miltex business."

Saying which, Reynolds left the office, with a none too gentle bang of the door that indicated a dissatisfaction he would not voice.

Mosby, still sore over the attitude of his associate, leaned back in his chair, crossed his hands over his stomach, and closed his eyes, as was his habit when business problems weighed heavily.

"If there was only some way of getting away from this rotten practice of over-bidding the other fellow on those old truck deals," he mused.

* * * *

The door opened and a clean-cut man stepped in, walked over to the desk, and handed Mosby a card, on which he read, "Will Dorite. Representing Square Deal Truck Company."

"You probably never heard of us," said the caller, noting the puzzled expression on Mosby's face.

"Well," said Mosby, with a wry grin, "to be perfectly frank with you, I didn't know there was such a thing as a square deal truck company."

"Well, there is," said the stranger, laughing heartily at the thrust, "or at least there will be just as soon as we get into operation. We've got nearly all the truck dealers signed up—and we want to get you people in on the deal."

"What do you mean—what's the idea?"

"Simply this. We are going to handle used trucks exclusively, and while we are going to make some money we propose, if you'll let us, saving you fellows from yourselves."

"Well, you certainly brought your nerve with you," gasped Mosby. "We've managed to worry along fairly well without any outside assistance, and I guess we're capable of continuing to do so."

"I'll grant all that, save in one respect. What's the worst thing you have to contend with in this business? I'll tell you—it's the used truck end of the game. Now, isn't it?"

"You're right the first time," assented Mosby, warmly, the memory of his argument with Reynolds still fresh in mind.

"And it's the worst end of the business, because you fellows have to meet the competition of some other dealer who is trying to go you one better, and offers an impossible price for a bunch of scrap iron that will hardly run so he can get the order for a new truck. Isn't that so? And between times you're probably doing the same thing."

"Well," said Mosby, with a meaning shrug of the shoulders, "at least the other fellows do it."

"We're going to do away with that practice," went on Dorite.

"Sounds good. But the day of miracles is past."

"It is no miracle that we propose working—just plain business sense and a little co-operation from the dealers."

"Go on. I'm listening."

"As I said, we will deal only in rebuilt trucks. When an owner wants to make a trade with you for a new truck you call us up. We'll send an appraiser. He'll look the truck over, and we will tell you how much we will give you for it—spot cash."

"And meantime," interrupted Mosby, "one of our beloved competitors up the street will bid \$50 more and get the order for the new truck. Some system, that's sure."

"But it won't work out that way," said Dorite.

"You've got to show me."

"Nothing easier. We will suppose that your prospect is dissatisfied with the price you offer him for the old truck. He sends it up to one of your competitors, and tries to drive a bargain. The first thing that dealer does is to call us up, and the appraiser will give him exactly the same figure he gave you. It will be the same all the way along the line, because the dealers will all belong to this association, where they are pledged to clear through us on the matter of used trucks."

"The fellow who is trying to get the best of the bargain will find one price wherever he goes—and instead of a resale hinging on how much he can get for his old truck it will be a matter of salesmanship—as it should be. Don't you see what a fine thing that would be for all concerned?"

"But how long do you suppose it would be until some of the fellows were out-bidding us?"

"Or you were outbidding them," added Dorite, with a laugh.

"Well, put it that way if you want to."

"I don't think such a condition would arise if the dealers could be given the assurance that they were getting a square deal all the way around."

"Take your own case as an illustration. You'd rather not have to outbid a competitor, especially to an extent where you're liable to lose money on the deal—but you do it because under existing conditions you can't tell what he is going to do, and naturally you want your share of the business. As it is now you fellows simply are bidding against yourselves. And you know that you are—through fear."

"Well, that's about it," admitted Mosby.

"That fear will be done away with under our plan. The man with an old truck that he wants to trade in will know that the first quotation on an allowance is final, whoever gives it to him, and that he couldn't do a penny better anywhere in town. It will take a little time to educate them up to the fact—but it will come."

"And your part in the deal will be?"

"We will take the truck off your hands so you will have no further expense or worry. Our appraisers—they're the best judges of trucks that we can hire—will look the machine over and tell us just what it is worth to us. That will be your price to the owner."

"And then you'll work those old lemons off on unsuspecting victims, and they will curse our trucks the rest of their days."

"Not on your life. We're not doing business that way. Every truck will go into our shop, be taken down, worn parts renewed, and when it goes out the purchaser will have our guarantee that it is in good condition mechanically—and we'll sell it to him at a price that will clear us. We've got plenty of capital—and we're going to put this thing over big if you dealers will help us—and help yourselves. Isn't it worth trying?"

"Worth trying—well, I guess. If I have anything to say about it we'll sign up right away. There isn't a truck salesman in this town that wouldn't be tickled to see such a plan put into operation. And as for us dealers—wait till I get my partner in here. Oh, Reynolds—Reynolds!"

Mosby sat bolt upright in his chair. The office was vacant save for himself.

For a moment he sat there too dazed to fully realize the disappointment he felt at the collapse of the air castle.

"That certainly was some dream," he ejaculated, brushing away the cigar ashes from where they had spread themselves on his vest while he slept. "But it's a corking idea, just the same, and there isn't any reason why it couldn't be worked out if the fellows—we fellows—were only wise to ourselves."

Buffalo Dealers Discuss the Second-Hand Problem

(Continued from page 14)

would never do it. It is this. Why could not the dealers get together and form a second hand truck exchange. The duties of this exchange would be to inspect and set a price on the truck. Then the exchange should give the owner a card, on which would be stated the exact amount any dealer should allow for the used truck. Nothing under or below this figure should be allowed by any dealer.

"If this were possible it would be fine, but I fear that it is apt to be almost utopian."

Arthur J. Sanderson

Arthur J. Sanderson, agent for the Service, when questioned by the writer relative to this momentous question, said in part: "Whenever I do handle a second hand truck it is nearly always a Service. I adhere quite strictly to this because I can best judge a Service. I know what it can do and what effect a certain amount of wear and tear will have upon it. As a result, I figure that each year that a Service has been doing active work, if kept in good condition, it has depreciated 20 per cent. At least, that's how I arrive at a basis as to what I will allow for a used Service.

"With that as a working foundation I set out to inspect the truck very carefully. And in inspecting a truck I always take the truck out on a very wide and level street. Once on this street and the road is clear, I set the truck in motion and then gradually I allow my hands and feet to become free from all throttles, brakes, wheels, etc. Now why do I do this you ask? Because by so doing I find the truck will swing to one side of the street or the other. This at once tells me that the former driver was stronger with either his right or left foot or hand. As a result, one brake or throttle, etc., is apt to be weaker than the other. All of this I carefully note on my card. Now when I sell the truck I can post the new buyer on all these points and thus save him a good many dollars and my reputation.

"After having made a careful inspection of the truck, I then get up a new list of my second hand trucks on which I carefully note the number of the truck, model, its capacity, the year, condition of tires, mileage it has covered during its life time, style of body, old and new price, etc. Then I send this list to all of my agents throughout the state.

"All of this having been done, my agents and I call up by telephone, or call in person, all prospects who are in the market for a cheap truck. If the prospect shows signs of buying, then we make a study of his business to find out if the truck is adapted to his particular business. And it is because some dealers do not take trouble of studying a man's business before selling a prospect a second hand truck that they multiply their own difficulties. To sell a man a used truck merely to get rid of it, shows a lack of good business judgment."

He ended his remarks by saying: "In selling a second hand truck one should first announce the price to the prospect. Then give him a ride around the block. Follow this up with quick action, because you must get the man's money while he has his hand in his pocket. Impress on his mind that every driver should carry the governor in his head. Give the driver an interest in the truck by offering to him a bonus if his repairs and other expenses are under a certain margin."

All of these dealers who are so in earnest and honest in their efforts to dispose of second hand trucks fail utterly in one thing. They fail to see the value of displaying used trucks. Ask some of them why they don't place the used truck in their show window and up will go their hands in horror. Never would they commit such a sin. Such action, to them, would be a disgrace. They prefer to keep used trucks where most people would

store their wood and coal—in some gloomy dark corner. They fail to realize that in order that one might be able to sell an old hen that one must dress it up in its finest feathers and then place it where it would attract attention and create a desire on the part of the passer-by to buy. People will never enter an old dark corner of a gloomy room to buy a truck unless they are badly in need of one. A gloomy showroom and a gloomy looking truck would cause any man's ambition to buy, to flee. Therefore if dealers wish to get pleasure out of the gloomiest end of their business then they must set their inventive abilities in motion and give expression to better ways and means of properly displaying used motor trucks.

All of the foregoing are but primitive expressions of ideas as to how used trucks might be disposed of. And if men will but think, these will of necessity be compelled to give way to greater and better ideas.

What Kansas City Dealers Say and Do

By W. D. MENG



THE consensus of opinion on the used truck proposition at Kansas City seems to be that the demand for good used trucks with service in them will constantly exceed the supply, and that nobody need worry about the process of getting rid of them. So far, there have not been enough used trucks thrown on the market to embarrass the situation, and while some of the dealers have thought on the subject considerably, no plans have been made to take care of any volume of second-hand cars.

The dealers in used pleasure cars—and there are many—almost unanimously reject all offers to sell them used trucks. "If we can't sell them for commercial use, there's no money in them for junk," they complain. Pleasure cars are bringing almost as much for junk as they are for use, unless they are very popular makes, of known high quality. The heavy pleasure cars are a drug on the market. The light cars are apparently easily salable.

And this is the case with trucks, too. Unless the owner of a heavy truck gets his money out of it before turning it in, he loses. There is comparatively little demand for heavy used trucks and comparatively small supply. But there is a good demand for light trucks—a demand that is pretty well taken care of by the new light trucks now being put out at low prices. The man who needs a big truck usually has the money to pay for it—or buys on payments and lets the truck pay for itself. If he really needs a big truck, he is as well off to buy a new one on payments as to load himself up with a used truck.

The ostensible field of the used big truck seems pretty well taken by the used touring car turned into a truck. There are hundreds of these trucks on the streets of Kansas City, and in all cities perhaps. There will

be hundreds more. One large furniture house has been advertising to buy a large number of used cars of the Packard and Pierce-Arrow classes, which it is going to give truck bodies to in shops under the direction of its manager of transportation. The firm expects to get its trucks for \$600 or \$700 apiece in this way. There are literally hundreds of Ford cars being bought second-hand and turned into light trucks.

When these transformed passenger cars are ready for the scrap heap their parts are still salable for replacing parts in passenger cars.

There has not yet developed a trade in parts for trucks.

So the used truck will hardly find an outlet to the man who merely wants to economize on a permanent investment, unless the truck he can get has been maintained in good order, and still has a lot of use in it.

Dealers generally believe there won't be many such trucks on the market; that owners will more and more tend to use their trucks, keeping them in tiptop shape, until the value is all gone. And then it would be an imposition on the customer to sell him such a broken-down truck.

When occasionally a used truck has to be disposed of, for other reasons than its decreasing efficiency, such a truck can and will be salable, and at good figures.

System of Co-operation

It is not strange that no steps have been taken to organize the used truck business, since there have been so few offered that are fit to be sold for use. But it certainly seems that now is the time to start a movement that will take care of the problem when it arrives.

Some dealers who discussed the problem suggested that there should now be undertaken a system of co-operation and exchange of information among the dealers.

with reference to used trucks. All the manufacturers are vitally interested in the maintenance of values, and in the maintenance of confidence in the truck. The entire industry, then, would be vastly benefited if the man who really wants a used truck can get it easily, and if the owner of a truck in good condition could sell it easily for a fair price. If this condition could be brought about there would be a leveling of values of used trucks, and a check would be put on any tendency to inflate allowances. It has been suggested that a bureau could be established in each large center of motor truck distribution, to which information could be sent of customers for used trucks, and information also of used trucks available. Such a bureau, supported by and managed by the dealers, would maintain high ethical practices; its purpose would be to sustain and develop the truck business.

It is not likely that any firm will soon provide the large capital necessary to go into the used truck business independently. But the capital of the dealers and manufacturers, as involved in receiving trucks in exchange for new ones, would establish an immense exchange, and each dealer would be an agent for it, would show his own used trucks at his own place, and have the chance to sell a new truck to the customer. Then any possible danger in the used truck situation would be avoided.

The investigation of the used truck problem in Kansas City disclosed many interesting cases of trucks that have gone through many hands. There was the big Reo, for instance, that was sold originally to a transfer company. This company traded it to a hardware dealer, who sold it to one of the largest sash and door companies in the United States. This company used it for exactly the same service as a new 5-ton truck it had bought for \$6000. The sash and door company sold it to a man who was in the express business, and hoped to build a larger trade hauling heavier stuff; he found he was mistaken in his opportunities, and sold the truck to a farmer at Oak Grove, who was using it to haul stock, at last reports. This farmer had a Reo touring car. One big coal company bought a new Reo truck, a large one, at the same time buying a used Samson for lighter work. An 1800-lb. used truck went to a bakery at St. Joseph, Mo.; a 1000-lb. truck, used five years, was sold to a pie company, as used a year, and traded in for a new truck.

In many cases truck dealers do not take in used trucks in exchange, but assist the owner to find a customer. In most cases the dealers help the owners, preferably, but usually they take the trucks in, giving an allowance.

Sell 'Em to the Junk Man!

The used truck problem in Kansas City is as simple as A B C—sell 'em to the junk man.

The chief objection to this plan is that the junk man doesn't want them.

He's too busy making money out of junked passenger cars that have plenty of valuable metal in them.

Well, the wrecker, then.

Same with the wreckers—they buy touring cars. There is a strong demand for parts of

touring cars from firms which repair and rebuild them.

Plenty of truck bodies in front and behind, and all around the establishments of the wrecking companies. Truck bodies, yes—but they did not come from "regular trucks." They came from touring car chassis. The wrecker wouldn't have bought them if they came from trucks.

"I wouldn't know how to buy a truck," said one wrecker.

And about the same answer was made by several junk men, whose places were littered with fragments of touring cars.

A Wide Market for Used Trucks Says I. H. C. Man

I. T. Wait, sales manager for the International Harvester Co., Kansas City, relates many instances of the trucks of this company passing through numerous hands. He is of the opinion that the demand for used trucks is only beginning, and that there



International Harvester Company Finds Ready Market on Farms

One of the Bell Telephone Company's trucks which it is replacing with trucks of larger capacity. These trucks seem to have a ready market for produce handling and farms especially.

will be an increasing outlet for them, and at steady prices, as the industry grows.

Farmers, transfer companies, truck handlers and similar lines are looking longingly at trucks for the time-saving effected by them. Many farmers hesitate to buy new trucks until they are sure they can handle them, and until they have investigated the procedure of doing business with them. They feel more like trying out the new plan, when the investment is only 20 per cent. of that in a new car.

Here is a typical history of one of the I. H. C. trucks. It was bought new by the H. C. Gaugh Feed Co., and sold, when that company had got the fullest efficiency out of it, to George Guenther, a farmer. Mr. Guenther traded it for a furnace to the Kansas City Furnace Co., and they turned it in to another truck company for a new truck. The company sold it to a farmer, and it is still operating.

Excessive Allowances Are Demoralizing

Many Kansas City truck dealers have stringent rules in their establishments on the subject of taking trucks in exchange for new machines.

"We will not take a used truck in exchange unless we already know where we can sell it at a profit," said one dealer. "There is absolutely no use stocking up

with them, for the market is likely to be nil on them for some time."

Several dealers complained that some of the truck handlers were giving unreasonable allowances on used trucks and so demoralizing the market for new goods.

"I know of more than one case where an allowance of a thousand dollars was given," said a dealer. "The owner of the used truck couldn't get more than a couple of hundred from anybody else, and could not sell his truck for cash at all. If there is much of this excessive allowance giving there will never be a cash market developed for used trucks, as is now the case with passenger cars."

Used Trucks to the Small Towns

The chief market for trucks in Kansas City, and a tremendously big one, is to the small towns of the territory. There is an increasing interest in the use of motor trucks in these towns—but the possible users are too often afraid of the large investment. They aren't sure that they can operate the truck profitably.

"I know of several used trucks that have been sold to small towns," said one of the managers of the Saurer-Mack agency in Kansas City. "While none of our trucks have yet reached the stage of being resold out of first hands, I have been studying the problem, against the time when it will become important. And that seems to me to be the solution. There is an unlimited field for the sale of used trucks in villages where trucks have never been used. While naturally a truck manufacturer or dealer—all of them in fact—would rather see new trucks go into new localities, so that the best possible showing could be made for the use of trucks, I believe that the placing of cheap used trucks in these places will not seriously retard the development of the trade. The men will learn to handle trucks with machines that do not represent a large investment, and will gain confidence by doing so; they will also probably use them more freely than they would new trucks, giving them a better chance. If the purchasers are thoroughly instructed that the used trucks are likely to give more trouble than new ones, I believe there will be little 'come-back' on the industry. And certainly this outlet will eventually be highly necessary to the trade."

Prefer to Receive Junk in Exchange

The Kelly-Springfield Motor Truck Co. at Kansas City has a very definite and conservative policy as to receiving used trucks in exchange for new ones. And it coincides well with the practice of several of the other big companies who are building for permanent results. The practice was thus expressed by Harry D. Shaw, house salesman, who is closely in touch with the policy of Harry T. Crosbie, manager:

"We don't take in many used trucks—and most of them are received as junk and disposed of as such. While we will give what a truck is worth—and no more—we find it unprofitable from the standpoint of keeping the satisfaction of the customers, to have much to do with trucks that still

have a little service left in them. The owner of a truck always feels that it is worth more than it really is. And since we aren't going to allow more than we can get out of it, we can seldom allow him as much as he thinks he should have. As a rule we do not receive a truck in exchange unless it is junk, or we have already found a sale for it. The salesmen are around town all the time, and often know just where they can place a used truck. If we don't know where we can place a used truck that is not merely junk, and for which the customer wants a liberal allowance, we allow the customer to go elsewhere. As a matter of fact, very few sales, if any, are lost because the customer can't get all the allowance he wants. They usually buy the truck they want, and keep the old one, to sell themselves, if we can't come to terms on it."

Quality and Name Sell Used Trucks

J. H. Toole, manager of the Kansas City White Co., has very decided views on the disposition of used cars. (Disposition goes two ways here—both as to what is to become of them, and as to the meanness and undependability of them.) Mr. Toole declares that he is willing to give good allowances on trucks of certain manufacture, which have quality all through, and which can stand up under heavy wear. Such trucks, he said, can always be put into good shape unless they have been very severely mistreated; and their names help to sell them. People have so long recognized certain names as standing for quality that they are willing to buy used trucks. Even large institutions are customers for used trucks of such makes. So Mr. Toole has no difficulty getting rid of them at the prices he pays—or a profit. But—

"Look at that," he said, pointing to a battle-scarred veteran in the garage. "Who would buy it? And what would they do with it? We allowed junk value, about \$150. We wouldn't sell that to a man who wanted to use a truck, for it would cost him too much to keep it going."

There was a 5-ton truck in the lot, for which under \$300 had been allowed—cost too much to put it into shape, and then there would be little value. The man who had run it for four years had got all the value out of it.

Used Trucks and Used Pleasure Cars

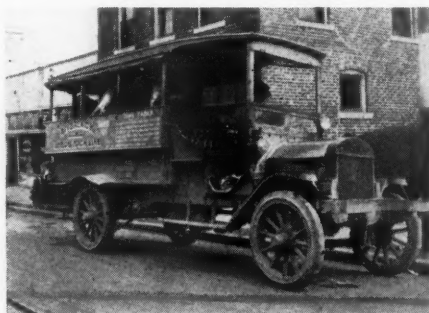
There will never be the same outlet for trucks that there is for pleasure cars; used trucks will not be handled by dealers on the scale of pleasure cars. For there is a sharp distinction in the reasons for disposing of used trucks and used pleasure cars.

This is the opinion of Harry M. Genung, manager of the H. A. Dougherty Motor Co., agent for Republic trucks.

"A man sells a pleasure car, or trades it, because he likes another car better," said Mr. Genung. "There are hundreds of reasons for an owner disposing of his pleasure car—and only two for an owner disposing of his truck. One reason is that the truck is not adapted to his business; there are few of these, and they are growing fewer, as the industry adapts itself more and more to the needs of special lines, and

as the salesmen grow more adept in satisfying the customer. The other reason an owner sells a truck is because it has ceased to be profitable. If it doesn't pay the owner to run the truck, it probably will not pay the next man to run it. There is no pride of ownership in running a truck—a man buys or keeps a truck because it pays him dividends; it is purely a business proposition.

"Therefore, I can't see where there is a field for the dealer in used trucks, nor any



From Jitney to the Farm

This GMC was bought for rural jitney service, then sold to a farmer for hauling live stock and produce.

call for special efforts to dispose of them to men who want to use trucks. We take in used trucks in part payment for new ones, occasionally. When we sell these used trucks we tell the customer that he can have every opportunity to inspect it, he can bring mechanics to go over it, but when he takes it outside our doors it is his. We are no longer responsible for it. There have been a few cases where owners had good trucks to turn back, which for some reason they didn't need—but they were exceptional."

Owners Must Spend Money on Repairs

R. A. Johnson, manager of a garage where heavy trucks are repaired, who does a large business, has definite ideas on the handling of trucks. He operates also the Truck Transportation Co. with Knox tractors and other cars.

"There is just one way to treat trucks to get money out of them," he said, "and that does not involve selling them when they get old. The only way is to keep them in tip-top condition all the time, and get the money's worth in use—and then sell them for junk."

"The most serious trouble we find with trucks brought in here is that they have



A Reo That Went Through Several Hands, Now in Farm Work

been overloaded. An overloaded truck is ruined, for it cannot be repaired without almost complete replacement, to be put into its former condition of serviceability and capacity. A truck that has been abused in this way has lost most of its value to its owner, and of course has lost practically all its value for resale.

"The next most serious trouble is that truck owners hesitate, or neglect, to keep trucks properly repaired. They want to skimp the repairs—and so allow their trucks to run down faster than they should.

"The original owner can get more value out of a truck by keeping on using it than he can get by selling it. But to guard against total loss in case an owner ceases to need a truck and wants to sell, he certainly should keep it in condition so that it will be worth more as junk."

Many Trucks Have Stood Up

The pursuit of the used truck led the correspondent among the transfer men—and he found many that had been in use many years, mostly trucks that the transfer men had bought new. There was Thomas Scott, owner of the Auto Truck Transfer Co. He has a Reliance that he bought new eight years ago, and has had in constant use since. For many years it was a picnic truck, and it has hauled thousands of people. On one occasion he drove it 46 miles, from Strassburg to Kansas City, on one chain, the other having broken on the way—the speed was twice as great, one jackshaft having been locked, but the 40 people were brought safely home. This truck costs no more for gasoline than the others; it is rated 3½ tons, but he often carries five or six tons. The repair bills are little more than for others—except that some parts are more expensive, not being carried in stock now. Such a truck would bring little or nothing second-hand—but it is worth as much as any other to its owner. It is used to haul rolls of paper and heavy stuff.

There is the Gramm of the National Refining Co., in hard service for six years: three tons. One driver had allowed its machinery to get in bad repair, and his successor stripped the differentials. Repairs were made and the truck is again in active service.

There are the Walker electrics of the Kansas City Light & Power Co. still in service after five and six years. Indeed, all the trucks this company ever bought are still in active service.

The case of the Central Transfer Co. of Kansas City is perhaps most typical. This company has 20 teams, and has for years done heavy hauling for many manufacturers, jobbers and contractors. A year ago the firm had to take in a Wilcox truck on a debt; it didn't want to do it, either, for it was afraid of trucks. But the officers made up their minds that this was a good time to try out the horseless drayage problem. They paid \$500 (in the debt) for the truck, paid \$150 more for tires, and started it out. The previous owners had seriously overloaded it, putting sometimes as much as six tons on this 3-ton vehicle, and dragging a couple of heavy wagon trailers. But good

A Saurer Truck on Firestone Tires Conquers Mount Wilson



At the Top

When experts needed material for the world's biggest telescope on Mt. Wilson, California, Firestone Tires on Saurer Trucks was the equipment that proved equal to tackling the mountain trail.

The conditions were *extraordinary* as will be seen in the photograph taken by Mr. J. A. Stoner, distributor of Saurer Trucks, Los Angeles, California. Grade 10%

much of the way; rocky road, narrow and tortuous; and a load of 16½ tons, which rested frequently *entirely* on rear wheels.

Such drastic tests prove the *in-built quality* which has made Firestone Tire equipment the choice for every road, load and condition of service. Consult Firestone expert on *your* problem. Write for catalog

FIRESTONE TIRE AND RUBBER CO., Akron, Ohio—Branches and Dealers Everywhere
"America's Largest Exclusive Tire and Rim Makers"

Firestone Truck Tires

mechanics put it into shape, and it is now giving excellent service. That it was satisfactory, despite the handicaps, is shown in the fact that the company paid \$1000 a month ago for a 4-ton Kissel. These trucks are always loaded to their limit and are nearly always busy. Cement, brick and carload lots are their specialties.

And the company is right down laughing up its sleeve—if a company can be imagined doing that—over these trucks. For many big wagons are standing idle in the yards, and these trucks are idle part of the time, too—waiting for the settlement of a building strike that will release several hundred carloads of building material that the company has orders to haul when operations start up again. The wagons and trucks are not costing anything—but the horses that go with the wagons are eating

their heads off. Thomas McGary, part owner and manager of the company, is well pleased with the operations of these used trucks—and it is a good guess that he will be getting a line on other used trucks, or new ones, for adding to his equipment.

The Continuing Market for Trucks, Used

It would seem that there would always be a permanent and fair market for used trucks to young men—or older ones—who are excellent mechanics, and understand trucks, and who want to go into business on their own account. Right here it might be said, however, that the schools for chauffeurs in Kansas City are not encouraging their graduates to buy used trucks to go into business. Most of these boys enter the repair business, with small garages of their own, in small towns. A few start bus or

freight lines—most of them buying new trucks, under the advice of the school managers.

But there are plenty of men who know trucks, and pick up used ones at low prices. There's A. E. Dale, for instance, with the Motor Express & Baggage Co. His brother bought a 1911 Packard touring car, made a racer of it, then made a truck out of it, and used it in grocery service. Now A. E. makes \$5 to \$15 a day hauling furniture and other commodities. This Packard truck, he says, is good for seven years yet.

Dozens of transfer men have done the same thing. They are operating on a small margin—but their investment is small. They can usually make repairs themselves, and if they lose a day or so their expenses are not piling up, and their business is ready when they get back.

The Used Motor Truck Problem in Chicago

What Some Well-Known Chicago Dealers Have to Say

By WALTER A. BERMINGHAM



THE haphazard handling of the local second hand motor truck problem has materially interfered with the obtaining of a fair or reasonable profit by agencies, dealers or factory branches engaged in selling commercial motor vehicles, as in many sales a part of the price is paid in trade for a used motor truck, for which a valuation is placed thereon, invariably far and away beyond its worth.

Lack of organization in the commercial car market has developed a class of prospects—and buyers, who have good reason to know that the prospect with a second hand motor truck, in a state of any degree of efficiency, can, in part payment for a new truck, make it count for sometimes, double its real value. One of Chicago's successful dealers advocates as the only fair and profitable method of tackling the second hand problem—to call in

The Junk Man

or to be more explicit, pay the market price per pound for their weight in old metal. This dealer, who refuses to be quoted, is not alone in his opinion, several others have been "stung" on part trade deals. There isn't a seller of new motor trucks in Chicago who will not gladly dodge the issue of accepting a used truck in part payment, if possible, although some have become wedded to the custom and uncomplainingly accept their losses, believing that only a Moses coming out of Egypt can untangle the snarl caused by the present second-hand commercial car situation.

Of those interested in a movement for the improvement of the Chicago motor truck market, a leader, H. S. Dunlavy, branch manager of The Kelly-Springfield Motor Truck Co., said, "The old used truck, which about 80 per cent. of prospective purchasers wish to turn in as part payment on a new

truck, is the most serious problem facing motor truck dealers as for their antiquated junk they demand from 100 per cent. to 300 per cent. more than its worth. They search the market until they find a victim in some dealer who is unable to figure his overhead and who is foolish enough to give a ridiculous price for the old truck. The dealer then does a little tinkering on it, gives it a coat of paint and then tries to break even by selling it. This market is big enough, sooner or later, to catch the inexperienced buyer, who pays double its value, tries to run it, fails and becomes a motor truck knocker. The dealer, who thinks he has put one over, does not think or care that he may also have injured the trade generally. Although dealers attempting business by these methods are apt to come to grief, with a brief business career, their operations are bad for those of us who believe and follow fair business principles.

"I have found it poor policy to take a second-hand truck without thoroughly examining it or learning if it could be put in first-class operating condition; in other words, if it would pay us to overhaul it and place it in the market with a six months' warranty, we thoroughly protect the purchaser and also protect our warranty with enough margin of profit to take care of it and our full commission on the sale of the new motor truck when the used truck was taken in part payment.

"Here are two instances showing

How It Works

"I took in a Stegeman motor truck, one used about three and one-half years, from a milk dealer, in Rockford, Ill. He bought a new chassis, mounting the body of the old truck on it. I allowed him \$600 for the Stegeman delivered in Chicago. We took this truck down, motor, jackshaft and differential, put in new parts where necessary; in fact, put the chassis in first-class shape. The truck sold for \$950, with a six months'

warranty, leaving a profit of about \$100 between the cost and the selling price to take care of the warranty.

"I took in a two-ton Velie from a large firm of meat dealers, allowing them \$1000 for the chassis, they retaining the body. I had this chassis thoroughly overhauled and sold it for \$1400 with a body, the whole job painted and lettered. The body was a second-hand job but in excellent condition and just what the purchaser wanted. I gave a six months' warranty on this truck and had over \$150 profit to take care of the warranty.

Always Put Used Trucks in Condition

"I have always found it good policy to put a used car in first-class condition, giving a six months' warranty. It not only proves to the purchaser of a second-hand car that you want to treat him perfectly square, but gives him confidence in the truck that he is buying, as he thoroughly realizes that you would not warrant a truck for six months unless you knew it was in good condition. You are, therefore, always able to get a much better price and give a good job. When a buyer is on the lookout for a used car, in most instances the physic effect, or the first impression, has more effect upon his mentality than real quality, for if a truck looks good to him he figures it must be all right. Therefore, if you have a truck looking well and in first-class condition, you do not have much trouble in getting the proper price, and at the end of the year find your second-hand department has either paid you a fair margin of profit, or at least broken even.

"As an instance of how this works out from a sales standpoint I might refer to the sale of a rebuilt 1½-ton chassis which I sold to a milk dealer on the West Side. This man came to our salesroom one afternoon and inquired for a rebuilt chassis. I had

The CCJ has most advertisers because it gives them biggest returns

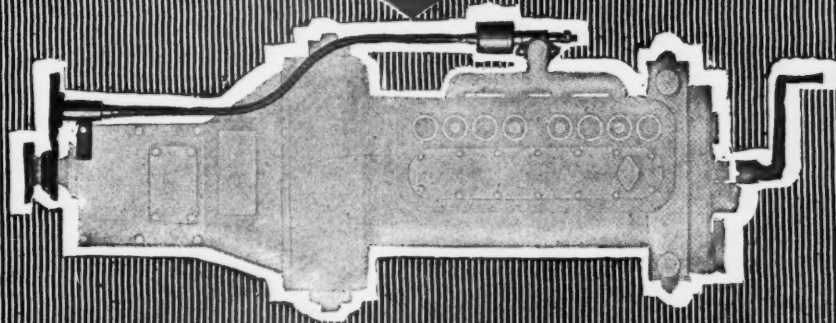
Used by all who place Quality first

PIERCE

Wherever you find the other Leaders, look for the Pierce Governor. It has received the very highest recognition from the leading American Truck Manufacturers—They USE it.

PIERCE
GOVERNOR
CO.

Anderson, Ind.
U. S. A.



one which had been run two and one-half years in the expressing and moving business, but which we had thoroughly rebuilt, including new fenders and hood and new tires all around. I took him over this job from radiator to tail lamp, and he said he would return the next afternoon with an expert. He kept his promise and turned up the next day, had his man examine the chassis and tried to buy it for less than I had quoted the previous day, which was \$1250, with a six months' warranty. I would not make any reduction, however, and he purchased the chassis, giving me a check for \$500 to bind the bargain, and three days later paid the balance and drove the chassis away to have his body mounted. It was somewhat unusual for a man to buy a used truck and pay \$1250 for the chassis so quickly and with so little argument, and I so remarked to him after I had completed the sale. He told me that a neighbor of his in the soap business had purchased a used chassis from us two years previous, and it had been on the job practically every day, and every statement we had made when sale was made had been verified in the operation of the truck, and that we had done more for him than we had promised. He wound up by stating that he purchased more on our reputation for fairness than from any knowledge of trucks.

Refuse Trucks of Unreasonable Owners

"After we have looked over an old truck and find the owner altogether unreasonable in his demands, we invariably 'pass up' the business and let someone else have the trouble, expense and loss of handling the old truck, as we do not consider the sale of a truck important enough to warrant this kind of business, for people of this calibre are unreasonable in their demands for service, usually abuse the new truck up to 100 per cent. overload, and then when any trouble develops, swear it has never carried more than a capacity load. We figure that unless we can make a profit on each transaction, it would be impossible to continue in business and give the users of our trucks proper service. There are always enough buyers who are willing to pay for quality and service to give any truck dealer, if he has the right kind of a selling organization, a fairly satisfactory business, and in our estimation this is the only kind of business to have on the books."

A Chicago dealer up to as recent a time as last winter was local agent for a line of heavy capacity motor trucks. His profit, so he stated, was derived wholly from overhauled second-hand trucks taken in trade. He claims it was impossible to do business on any other basis. At present his efforts are entirely devoted to the second-hand market.

Auction Proved Successful

On June 17th, Harry P. Branstetter, distributor for Illinois and Indiana for Kissel Kars, held an auction of used cars and a few motor trucks. He realized from the sale \$8200, at an expense of 3½ per cent., as he paid the auctioneer \$100 for the day and \$180 for newspaper advertising. The plan is new in Chicago; the attendance was large.

Mr. Branstetter is satisfied, so much so, that he is going to try it again.

Eugene Goldman, manager of the Master Motor Truck Co., the record-breakers in sales of commercial cars, the Republic Motor Trucks, ventilates his views of the problem tersely, saying "I'm through trying to do business with those who buy a second-hand all-in truck for about \$100 and then try to work it off on us for \$400 or \$500. No trade at any price. We find that prospects go out of the way to buy an old piece of junk to trade in."

Manager C. J. Holdridge, of the Gramm Commercial Car Co., emphatically said in answer to the question: What can you tell us about Chicago's second-hand motor truck problem? "We had rather lose the business than fool with it."

Much of the blame is placed on the shoulders of the Chicago commercial car manufacturers by both dealers and factory branches. They claim the local factories that are almost wholly assemblers, solicit trade for a small margin of profit, having neither advertising nor salesrooms expense, hence they go beyond the limit in exchanging the new for a good large portion of the antique, for a value far from their worth. They are the goats it seems.

TIMKEN BRINGS OUT NEW FIVE-TON WORM-DRIVE AXLE

The Timken-Detroit Axle Co., of Detroit, Mich., has just added a 5-ton worm drive axle to complete its line which includes the ¾-ton, 1½-ton and 3-ton.

This new axle has a pressed steel housing of exceptional strength and is equipped with Timken-David Brown worm gearing and Timken roller bearings. The load sustaining portion of the axle is continuous from spring seat to spring seat, and is made of pressed steel 6 in. square at either end under the spring seats and enlarges to a spherical shape in the center to provide clearance for the worm gear and differential. The housing is built square at the spring seats in order to give a firm seat for the spring saddles and to give greater strength at the smaller ends of the axle.

The center of the axle is open on the top for the attachment of the flange of the carrier which holds the worm shaft and its bearings, the worm gear, differential and bearings being in one complete unit. The ends of the stamped steel housing are flanged to a large diameter and the brake

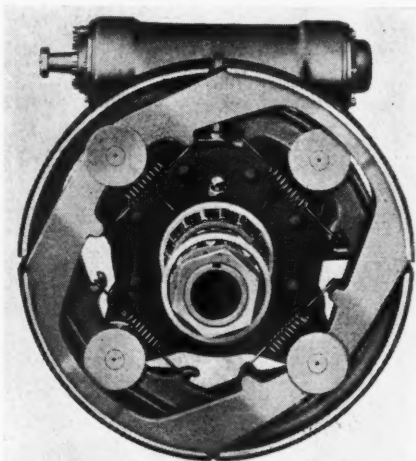
spider is riveted to this flange in a very substantial manner.

This axle is of the full-floating type and has large Timken wheel bearings mounted upon chrome nickel steel tubes which extend inwardly almost as far as the differential bearings, and is supported in the housing by means of filler pieces welded and riveted to the axle housing, and into these filler pieces the tubes are inserted under great pressure.

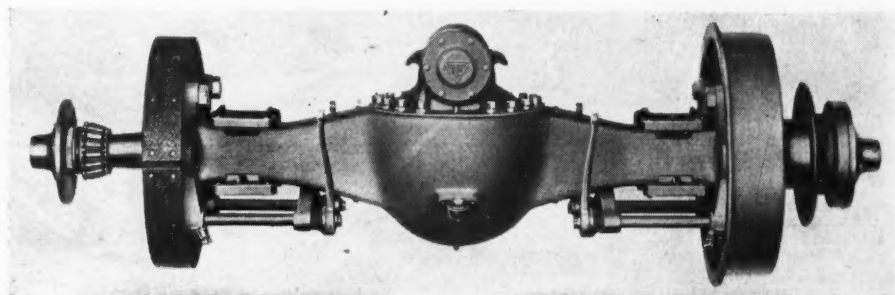
This axle is capable of carrying on the rear wheels a weight of 15,000 lbs. The brakes are 24 in. in diameter by 4 in. wide, of the Timken internal duplex form. The brake drums have a substantial flange to keep brake drums from distorting. This form of brake has proven to be very reliable on heavy work especially, and to give the positive braking facilities demanded by trucks of such large tonnage.

WRECKING TRUCKS FOR MEXICO

A power winch, with 300 ft. of steel wire cable and two capstan heads, is the feature of a new type of wrecking truck that will aid the motor truck trains in Mexico when they get into difficulties. Several of these are now on their way south, and others are being turned out by the Thomas B. Jeffery Co., Kenosha, Wis., as fast as possible, in anticipation of the rainy season in Mexico. The chassis of this unusual machine is the Jeffery Quad, which drives, brakes and steers on all four wheels. About 200 Jeffery Quads for various purposes are already in Mexico.



Showing the Massive Brake and Drum



Rear View of Timken Five-Ton Axle

The box-girder construction of the pressed-steel housing is a feature

The CCJ brings greatest returns to advertisers because of largest circulation among quantity buyers


 The advertisement features a large, stylized graphic of a Selden truck's front end, including the hood, headlights, and a large wheel on the left. The word "SELDEN" is prominently displayed in a large, outlined, sans-serif font within a rounded rectangular frame at the top left. Below it, the word "TRUCKS" is written in a bold, solid, sans-serif font. The truck's hood has a circular emblem with a stylized "S" in the center. The background of the truck's body is filled with a fine grid pattern.

SELDEN

TRUCKS

Head towards success by representing the Selden Truck. It is the truck of great accomplishments and the foundation for a profitable business for the live dealer.

Its high standard of construction, its performance under adverse conditions, and its economical operation are selling points that have appealed to the discriminating buyers of two continents.

Everywhere the Selden goes, repeat orders follow, which establishes an agency of ever-increasing value.

This is the Selden Line:

1	Ton Worm Drive	- - -	\$1700
2	" Internal Drive	- - -	2000
2	" Worm Drive	- - -	2250
3½	" Worm Drive	- - -	2950

Don't delay, but write and have us explain our proposition thoroughly.

Selden Truck Sales Company
210 East Avenue ROCHESTER, N. Y.

KEROSENE VS. GASOLINE IN STANDARD AUTOMOBILE ENGINES

(Continued from page 16)

and more slow; so, as only a limited time is available in engine apparatus, an excess of temperature is desirable even temporarily. Also, a local depression of mixture pressure is desirable, because, according to the equation, if even for a moment this be half the standard 760 mm. then only half the vapor pressure need be developed, and if the mixture, if even for a moment this be half the sure, such a pressure depression will promote vaporization and leave the mixture saturated on recovery of the full pressure in shorter time than without such a pressure depression or temperature excess.

Real fuels are not such simple compounds as these, but are solutions of one group of compounds in another, which can be partly though never wholly separated by fractional distillation, generally in tenth fractions. In Fig. 3 a present-day gasoline and a kerosene are given as fractionally distilled. An

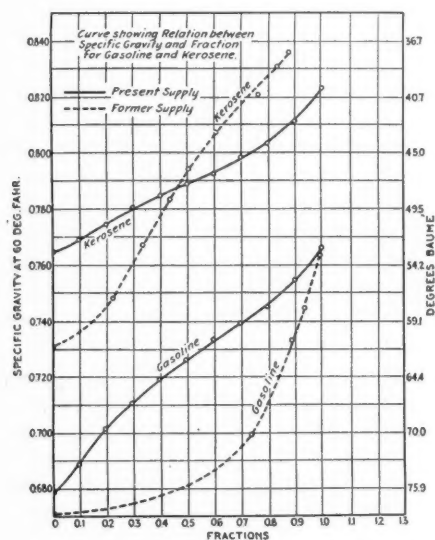


Fig. 3. Gasoline and Kerosene Fraction Curves

older kerosene and a gasoline are shown dotted so that the changes in these classes of fuel that shortage of supply has forced, are made clear. In spite of higher prices, the present gasolines are heavier and much less volatile, the final temperatures of their several fractions rising more and more toward the values more characteristic of old kerosenes. The corresponding densities of the fractions are given in Fig. 4.

The effect of these complex mixtures on the vapor pressure condition cannot be shown by a vapor-pressure curve for the fuel itself, and becomes clear only from a group of vapor pressure curves, one for each typical fraction. The most volatile fraction will be expressed by a curve of highest vapor pressures for the successive temperatures, while the least volatile will show small vapor pressures even at high temperatures. If one constituent did not interfere with the vaporization of another, as it really does, the relative vapor pressures at any temperature would be a measure of the relative volumes of the several vapors, and for complete vaporization these should agree in weight equivalents with the proportions of constituents present, shown by the fraction curves.

At the present state of knowledge on this subject it is not possible to make any predictions of the sort desired, for dryness conditions similar to what are possible for simple compounds, but recent investigations indicate that there is a good chance that factors can be derived that will permit the same method to be used, starting with the fraction curves and the vapor pressure curves of the fractions separately. For such work the fractions should not be equal but divided according to uniformity of temperature range for any one. The average engineer working on the problem of development would prefer to determine experimentally the dryness and dryness temperature by sight observation of a glass tube fitted with a thermometer, through which the mixture passes. Such sight tubes must be guarded with wire screens to avoid danger from accidental backfires.

Method of Determining Drying Temperatures

The vapor pressures of the fractions at a given temperature give an idea of the relative content of the vapors of each fraction that would come off at that temperature and are a good indication of the tendency of the heavier parts to come off last. This is most important because it is the basis of the deposits that are common to many vaporizers, and in it is to be found the reason for the vast difference between the actual temperatures required to dry the same mixture in one vaporizer as compared with another. If in one vaporizer or mixture heater there were the same degree of intimacy between the air and the vapor as in another, and if this were complete, the temperatures computed from the vapor pressure relations would be the ones sought and the same for all. Any variation in the degree of homogeneity of the mixture or any tendency for vapor to be in excess in one part over another, due to vaporizer construction and flow conditions through it, will at once require a temperature in excess of the true mixture drying temperature, because where the vapor is in excess the weight relations are disturbed, and high vapor pressures must exist with corresponding higher temperatures.

As the ratio of vapor weight to air weight at any given part of the mixture rises, so must the vapor pressure rise. At the limit, for example, it might be imagined that there was no air at all over the surface of some liquid lying in a detached pocket, . . . and it follows that the vapor must reach a pressure not of a few millimeters of mercury, but the full atmospheric pressure of 760 mm. Hg. Now, this is most serious, and destructively harmful, because the heaviest constituents of the fuel cannot develop a full atmosphere of vapor pressure at any temperature whatever; before they even approach the necessary temperature, they are destroyed by the heat, breaking down first to tars and then to carbon coke. It is also to be noted that the same reasoning leads to the conclusion that none of the air should be by-passed around the vaporizer if the vaporization is to be most complete at the lowest temperature and in the shortest time, and, of course, vaporization without simultaneous air scrubbing and mixing, is absolutely prohibited.

One of the most important lessons to be learned from the analysis, therefore, is the basic and fundamental importance of most thorough and vigorous mixing of all the air with all the oil at the time of and during vaporization in order to secure the dryness condition at the least possible temperature. In this way, not only will the dangers of tar and carbon deposits be removed even with heavier distillates than kerosene, but also

the dry mixtures will be the coolest, and the dryness temperature excess be the least, and the latter possibly zero. Cool mixtures are most desirable, but only when warm enough to be dry or substantially so, because they permit of maximum compression consistent with properly clean combustion. Their production by properly designed heated vaporizers requires the minimum of heat the lower the temperature, and size of heater is important in automobile work.

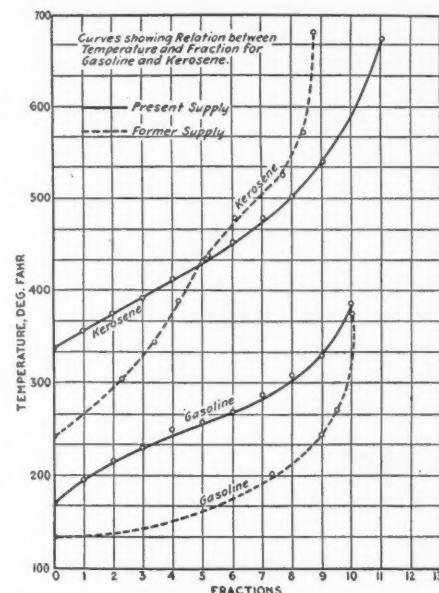


Fig. 4. Densities of Gasoline and Kerosene Fractions

Cases have been observed in which, due to bad design of such vaporizers, mixtures above 500 deg. Fahr. have not been dried, while with good design and the same kerosene fuel, perfect dryness was secured at 250 deg. Fahr., half as much, and with a vast difference from the operating standpoint as well as from that of design. Not only is the latter entirely feasible without pre-ignitions with reasonable compressions, but it is easily obtainable from the exhaust heat even when idling, whereas the former is not.

Classification of Heated Vaporizers

In form and arrangement heated vaporizers are divisible into classes based on the sort of passage provided for the mixture during its heating and vaporizing period. Into the first class fall all those passages that are more or less equivalent to a helical coil. Among these are the Brouhot, Fig. 5 (Sorel), and the Thornycroft, Fig. 7 (Clerk and Burls), a more recent English kerosene equipment. The second class is characterized by crooked, free passages, somewhat equivalent to coils but of irregular rather than regular form, illustrated by Crossley, Fig. 8.

Passages arranged to deflect the stream so as to separate out heavy liquid drops, and deposit the separated liquid into more or less isolated pockets in which vaporization takes place while the main stream passes by, are typical of the third class. The class is illustrated by the Petreano, Fig. 10 (Guldner), an old Italian form of multiple pockets, and Koerting, Fig. 12 (Guldner), the latter being of single liquid pocket type. The fourth class includes all those forms of simple free passages that tend to force the wall film formed by the heavy liquid drops along the heated walls without depositing in pockets. This class is illustrated by the Campbell, Fig. 13 (Clark and Burls), an English, and by the Capitaine, Fig. 14 (Clerk and Burls), a Belgian oil engine. In the former an elbow, and in the

"On the Job"

That's where you want your trucks, that's where they belong, and that's where they are if they are Signals.

You must have trucks that will stay on the road with the least expense to you—trucks that deliver the goods all day long and all night if you want them to. That is one reason for the rapid increase in the sale of Signal Trucks.

Buyers all over the country are realizing that the name Signal on a motor truck stands for dependable service.

One reason for this lies in the fact that this service is "built into" the trucks—the constructional units are the best and they show it in the service they render.

What success are you having in reducing your haulage costs? Have you been able to cut out some of the debit and make your delivery a credit to your business? Let us show you what you can do with Signal Motor Trucks in your business. A postal will bring some interesting information.

Signal Motor Truck Company

Detroit, Michigan



DEALERS:

You will be interested in the Signal proposition. We have a complete line of worm drive trucks ranging from 1 to 5 tons in capacity—they are built of such well-known units as Continental, Brown-Lipe, Timken; etc.—the price is right, the trucks stay sold and bring in repeat orders.

Have you gone over the situation in your territory? Think it over and let us hear from you.

**1 to 5 Tons Inclusive
WORM DRIVE**



When Writing, Please Say—"Saw Your Ad. in the CCJ"

latter the contracting walls of a straight conical passage serve to promote the formation of the wall film, and flow velocity tends to drive it along the hot surface where it is vaporized. . . .

Control of Air-Fuel Ratio in Vaporizers

The proportionality between air and fuel at the constant value required for combustion that is necessary not only for best vaporization conditions, but even more for the proper combustion of these heavy vapors, is controlled in still more various ways. The one best arrangement, that of the ordinary gasoline carburetor, of particular value when all the air is in contact with the vaporizing liquid, is used in the Brouhot and Thornycroft; mechanical means of doubtful value for throttle-governed engines because of variations in feed are used in the Koerting and Campbell. . . . Where throttle controls are used, no recognition is found of the importance of the throttle location, which should be before the vaporizer, so the latter may be under the least possible pressure to promote vaporization, and not after, as in the Thornycroft and Koerting, because here the mixture pressure never falls below atmosphere in the heater and vaporization is not helped.

Any bad adjustment of the proportions in the direction of excess fuel, or the use of bad lubricating oil or an excess of it, will produce smoke and cause exhaust deposits of carbon on the outside of these vaporizing passages. This layer is highly resistant to heat transmission, and as such a layer accumulates the heat received by the mixture lessens, until a point is reached where vaporization is incomplete and unsatisfactory. At this time the exhaust side of these vaporizer heater walls must be cleaned, but it needs but a glance at those illustrated to see that this is difficult if not impossible in some cases. It should be noted here that if the walls are hot enough, such exhaust smoke carbon will not deposit. This is true, for example, with the externally-ribbed form of the Capitaine, Fig. 14, and the tortuous passages of the Crossley. Internal temperature disturbances, such as overheating on the vaporizing side, especially when the oil is vaporizing in a more or less isolated pocket or corner out of and not vigorously scrubbed by the main stream, will likewise cause deposits first of tar and later of carbon, which also must be cleaned out. The remedy is first to avoid such constructions and to provide heat control means in the design, and second to make the vaporizing

surfaces themselves cleanable, which is not possible in most of the forms illustrated, though all of them have been, or are now in successful commercial use for other classes of work than automobiles.

In every case the mixture, consisting of all the fuel, and all or a part of the air, is supplied to these vaporizers in what has been called the rainy state, and as a result there is an early tendency for this to locate on the walls, which tendency is promoted by changes of direction of flow. As already pointed out, a wall film thus formed will tend to concentrate on the low velocity side of the passage, or drop by gravity or inertia into a pocket, if there is one, instead of distributing over it uniformly. An increased heating surface or size of vaporizer will then be required, and a higher temperature will be necessary to produce dryness just in proportion as these effects are different in one construction as compared with another.

Exhaust Heat Governs Vaporizing Conditions

At low loads the available exhaust heat is not only less in quantity than at full load, but in throttle-controlled engines it is at a much lower temperature normally. For this reason the vaporizing conditions do not remain the same in these vaporizers as the load changes, the tendency being toward deficiency at light load or excess heating of mixture at full load. Low load vaporizing deficiency is corrected in many of the stationary oil engines by using an oil lamp or torch, and even in extreme cases by relying on it entirely, as for example, in the Crossley and Capitaine forms. Of course, this is not admissible in automobile engines, which must rely entirely on exhaust heat for operation, though there can be no objection to a torch or burner for initial starting heat. Exhaust by-passes are provided in the Brouhot and Thornycroft forms to be operated by hand, which also is not permissible in automobiles.

Where exhaust heat is relied on, the vaporizer is large and there is clear evidence of an effort to provide extended heating surface. Small size is secured only where intense oil-flame heating is used, as in the Capitaine. Large heating surface would be necessary if only a small and fixed amount of heat were available for transmission through or mixture absorption from each square foot, and this is the prevailing idea of these older designers. It conforms to the old ideas of steam boiler practice, now abandoned in the light of better knowledge of the laws of heating transmission, which rec-

ognizes that the old heat "soaking" theory of constant rate is wrong, substituting for it the modern high velocity "scrubbing" theory, according to which the heating rate is not constant, but increases with velocity.

Heat Transmission and Loss of Pressure in Vaporizers

Even if a form of vaporizing heater suitable from the vaporizing standpoint be selected, the size, a matter of great importance, will depend on the degree to which that form conforms to the requirements of the heat transmission laws and at the same time to the laws of loss of pressure through the heater. Loss of pressure means reduced density of charge and power output, and from this standpoint any passage that is excessively long, tortuous or too much baffled is objectionable, especially if the full charge of air must pass through it, as it should for best low temperature vaporizing. Heat transmission rates in British thermal units per hour per square foot per degree mean temperature difference are by no means constant when heat is transmitted from one gas to another through metal plates, and the mean temperature difference itself is subject to even more variation with conditions of heater design and location, for a given engine. These two factors are prime variables in the size of a given heater, and the conditions that result in the maximum values for each and hence the minimum value for the heating surface must be clearly understood and recognized in selecting heater forms, their locations and connections.

Two conditions are to be observed in securing the highest value of the mean temperature difference; first, the condition on the mixture side, and, second, that on the exhaust side. On the mixture side the temperature must be kept as low as possible, and this is accomplished by using the full amount of mixed air in the vaporizer so as to secure dryness at the lowest temperature. On the exhaust side the gases are hottest at the exhaust-valve-port outlet, so that the heater should be as close to this point as possible. It is well known that visible flame, especially the red or yellow kind rather than the blue, has a heat-radiating power, and that radiant heat will pass from such a glowing point through intervening gases into metal walls practically without resistance, and at rates enormously higher than it can pass from a hot gas current through the same walls to a cooler gas current.

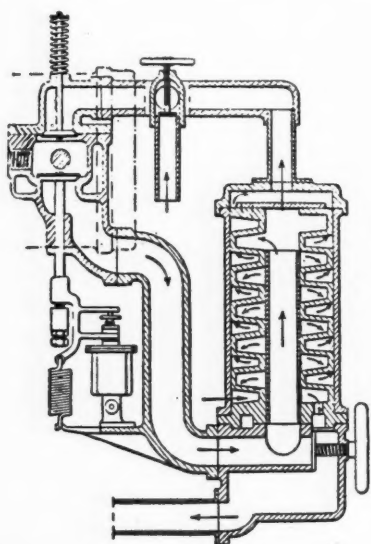


Fig. 5. Brouhot Mixture Vaporizer

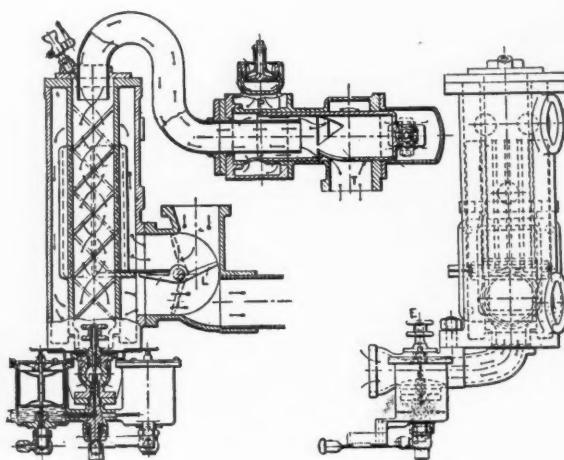


Fig. 7. Thornycroft Mixture Vaporizer

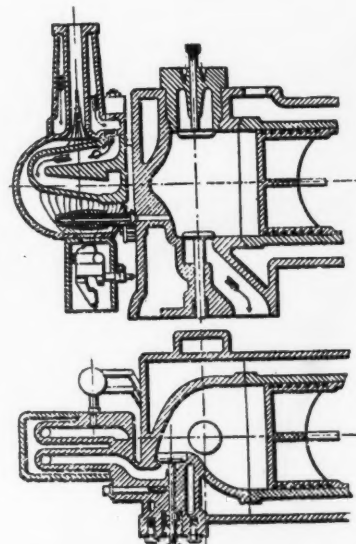
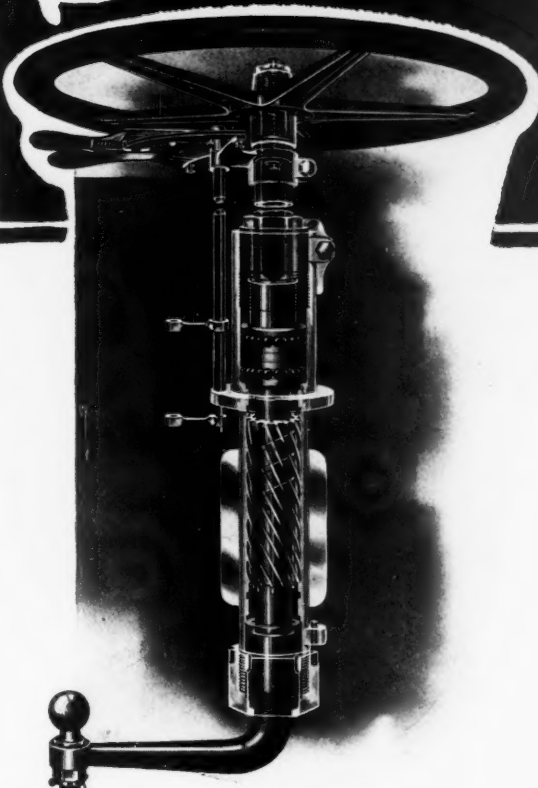


Fig. 8. Crossley Vaporizer

The CCJ has most readers because it gives most information

Steer Your Trucks with **ROSS** Steering Gears



You pick the units that go into the construction of your truck with all possible care realizing that the success of your truck depends upon the success of each separate unit. When you decide on a steering gear, decide on a ROSS, and take advantage of the fact that


108 Truck Manufacturers

are now using Ross Steering Gears on all or part of their equipment.

Think What This Means! Consider the Prestige!

It means that Ross Steering Gears have been endorsed by the MAJORITY of the Truck Industry, and that when you adopt Ross Gears, you are adopting the

STANDARD STEERING GEAR



The two cuts in this advertisement show the fore and aft and cross type steering gears, each of which is built in sizes to steer trucks from the lightest to the heaviest.

**WHAT IS BEST FOR THE MOST IS
BEST FOR YOU**

Write for catalog and blue prints

ROSS GEAR AND TOOL CO.

760 N. HEATH STREET

LAFAYETTE, IND., U. S. A.

The exhaust gases from these engines have radiating power, and radiant heat can be obtained from them by any walls placed in direct line. For this reason not only should the heater be close to the exhaust ports, but it should also lie so directly in front of them as to receive all the radiant heat in these gases before it is intercepted by any header or pipe connection. A heater conforming to these best conditions would, for a multi-cylinder engine, be of elongated form and be placed directly across the ex-

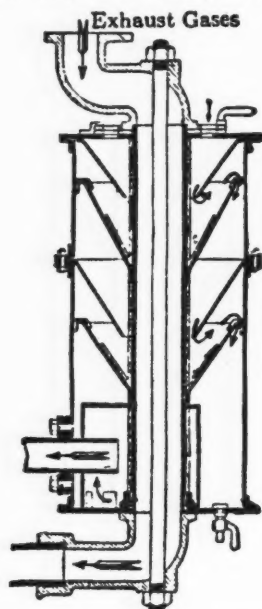


Fig. 10. Petreano Separating Mixture Vaporizer

haust outlets within the exhaust header. If not of this form, it should conform as nearly as possible to the conditions of closeness, although if the radiant heat be lost, more surface must be provided.

High Gas Velocities and Least Loss of Pressure

The unit heat transmission rate from hot gases to cooler mixtures, follows the law first suggested by Jordan and now established and known as the mass flow law. According to this, whenever the controlling resistance to heat flow lies on the gas side of a wall, the heat that will pass or be taken up by the gas is directly proportional to the weight of gas passing per minute. Therefore, as the amount of heat is the product of the specific heat, the temperature rise and the weight, it follows that in such a case the final temperature will remain constant, no matter how the flow may vary. According to this, the mixture should at all times be given a high velocity if the high rate heat absorption is to be promoted, by using small passages for the mixture. This, of course, runs counter to the requirement for least drop in pressure in ordinary passages, because high velocity produces pressure loss by friction. The best result is therefore to be obtained by a judicious balance between high mixture velocity on the one hand and excessive loss of pressure on the other, so that the heater size may be a minimum, consistent with least loss of engine power.

In any case the form of passage that permits of the use of the greatest velocities with least loss of pressure is most suitable, that is, the passage should be as frictionless as possible and no abrupt bends or eddy currents are permissible. Increasing mixture velocities will not necessarily increase the rate of heat transmission, nor will the final temperature be constant unless, ac-

cording to the mass flow law, the controlling resistance be on the mixture side of the heater walls. Should it be on the other, or exhaust side, the rate of heat transmission will depend on the rate with which the tube metal can get the heat. This also follows the mass flow law with one exception. The exception element is the radiant exhaust gas heat that enters the tube at a rate so much higher as to tend to keep the thermal resistance on the mixture side. Heater location directly in line with exhaust valve discharges therefore tends to establish not only the high rate of heat transmission desired for small heater size, but also to

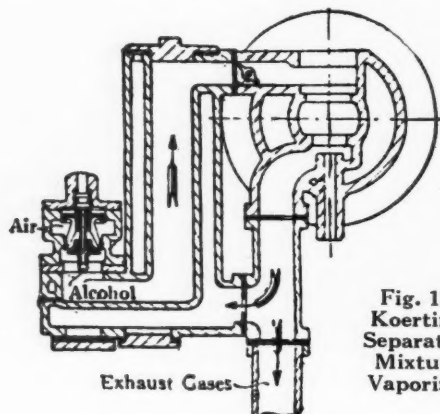


Fig. 12. Koerting Separating Mixture Vaporizer

keep the thermal resistance on the mixture side of the wall, which in turn is the condition for automatic constancy of mixture temperature.

To still further promote the same end, the exhaust gases must move past the heater walls with the maximum possible velocity. This is promoted by so locating the heater walls as to make the exhaust gases impinge on it with their high exit velocity, and by keeping the size of the exhaust passage along the heater walls as small as is consistent with non-development of excessive back pressure. By making the heater the restricted exhaust passage, instead of the muffler, the vaporizer will itself act as a muffler, and produce the desired heat transmission conditions with no more back-pressure than is now normal. The heat absorb-

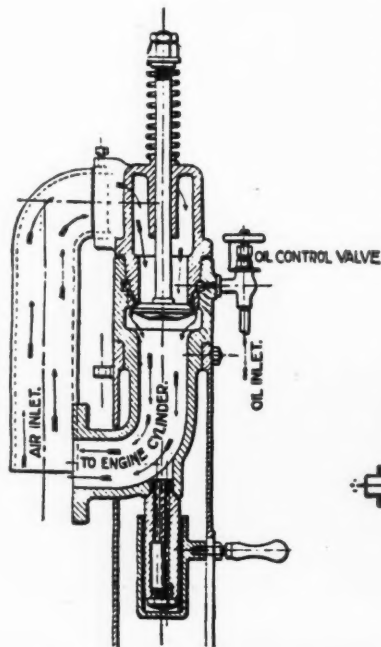


Fig. 13. Campbell Vaporizer

ed by the mixture has been taken from the exhaust, reducing the volume of the latter correspondingly, and hence the back-pressure beyond the heater in exhaust pipes of normal size.

With due regard to these conditions for high-rate heat transmission, the heater will be small and the mixture temperature as constant as they are perfectly executed. The result will be most nearly perfect when both mixture velocity and exhaust velocity are high, the latter higher than the former; when the exhausts impinge most directly and most vigorously on the heater walls; and when these walls receive the maximum radiant heat from the first escaping luminous exhaust gases.

The form of the exhaust valve ports may contribute to, or oppose these results; the former when they allow the gases to come straight out through the shortest possible passage; the latter when, as in block castings, the gases must make a double turn in a water-cooled pocket which cuts off all the radiant heat and a good deal of the hot gas heat.

Vaporizer Embodying Correct Principles

It is possible to design heaters and connections in a great variety of forms, and still conform to the principles. One form recently developed by Mr. John Good of Brooklyn, N. Y., will be described.

The Good vaporizer is in the form of a Venturi tube of narrow angle, made of thin steel tubing, which weighs little, is strong, and cleanable on both sides. Its length is made to conform to the exhaust header in which it is mounted, so as to be close to and preferably directly in front of the exhausts. This form of passage, by the well-known laws of such a tube, produces a high velocity at the throat with a correspondingly considerable pressure depression, and with the least possible overall loss of pressure between the ends. The high critical velocity promotes good heat transmission conditions; the throat pressure depression promotes quick vaporization by reducing the total mixture pressure and the partial vapor pressure; and pressure recovery is produced by the enlarging cone where velocity is converted back in pressure with practically no loss.

This Venturi heated vaporizer is shown in place in the exhaust header, Fig. 15, with an ordinary carburetor feeding it with a wet, rainy mixture. The warm dry mixture discharges around the end to the intake header just below, this engine having both valves on one side. The connections were such that it could not be placed in the most favorable position, directly in front of the exhaust outlets. Another and shorter form, Fig. 17, has external ribs intended to be placed vertically at the end of the exhaust

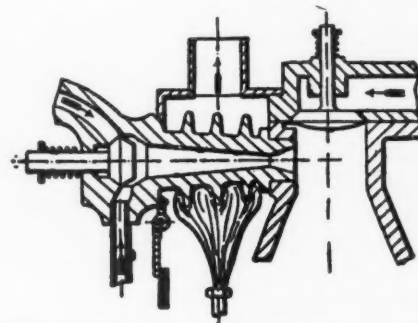


Fig. 14. Capataine Vaporizer

United States 'Solid Truck' Tires

Some Marvelous Money-Saving Facts

The United States Pressed-On Truck Tire is saving money daily for a host of truck owners.

It is saving on actual tire bills.

It is saving on truck repair bills.

And, it is saving by lengthening the life of motor trucks.

"Strong statements," you say? Yes, but every one of them is true.

Let one of our representatives give you the details.

If you operate motor trucks, you owe it to yourself to learn why United States Truck Tires are cutting the cost of operating motor trucks.

It is not a long story, but it is too long to tell here.

Let us send a representative to see you. He will explain how the United States Truck Tire can reduce the operating cost of your trucks.

United States Tire Company

BROADWAY AT 58th STREET
NEW YORK CITY

Branches in all principal cities give prompt,
liberal, courteous service



header, the mixture carburetor being below and the throttle-valve located between carburetor and vaporizer to get the full advantage for vaporization of all pressure depressions, due to a partly closed throttle.

Semi-Automatic Starting Burner

No vaporizer for automobile use can of itself be regarded as furnishing a solution of the kerosene problem, because starting heat is necessary, and this must be derived from the burning of kerosene in a suitable burner. The old suggestions and practices of starting on gasoline, or, of using electric heaters, are not satisfactory, the first because it is a nuisance, and the second because of the large storage battery capac-

fastened to it. The air supporting combustion is supplied through a flexible metallic tube from a small vacuum cleaner fan, geared to the Wing blower and the magneto. One turn of the shaft automatically starts the burner and it continues to burn as long as the motion is applied, stopping automatically when the motion stops.

In another form of this burner, one larger positive blower is made to take the place of the fan and small blower; this is shown in Fig. 19. Here the main air is divided, one part passing through a small Venturi tube, meeting oil at the throat where it is sprayed

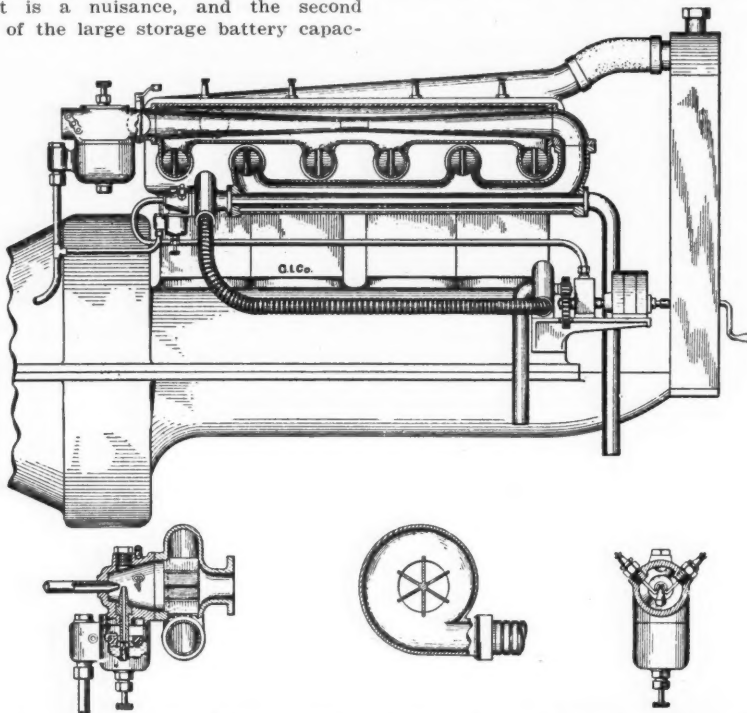


Fig. 15. The Good Venturi Mixture Vaporizer and Starting Burner

ity and the high rate of electrical discharge required. A good semi-automatic starting burner also has been developed by Mr. Good, and has proved to be thoroughly reliable. This burner, together with an independent starting heater, is shown in Fig. 15. The burner is located at the end of the intake header, and its flame passes along the inside of a small light steel tube, inside and close to the bottom of the header. The burner flame raises this interior tube to a red heat in about fifteen seconds, the products of combustion passing out the end and downward to a point below the engine. No flame ever appears at the outlet. . . .

The construction of the burner is shown by the lower right-hand section where the vertical oil nozzle, fed from a float-chamber, is crossed horizontally by a jet of air at about one pound pressure, produced by the smallest size of Wing positive blower, shown beside the magneto. The crossing air jet makes a fine spray of oil which moves past the spark points where it is ignited automatically by the magneto geared to the Wing blower. The spark points are arranged as shown in the lower right-hand section (Fig. 15) with the terminals bent up and toward each other. This causes the oil drops that collect to fall away to the lower loops by gravity, leaving the tips free to spark; before this was done the ignition was bad, but afterward it never failed in over a year. The spray flame escapes through an enlarged air chamber, supplying air around the spray to support the combustion, which becomes vigorous only beyond the radial guide vanes at the exit from the burner or at the entrance to the heating tube, tightly

by the high velocity. The main air stream is by-passed and led around the oil jet in an annular layer surrounding the oil spray to support combustion. The spark plug terminals are bent toward the high velocity jet so the collected oil drops will be driven back and away, independently of gravity. . . .

Operation of Burner

This equipment, applied to an engine on the test block or to a car on the road, works with satisfaction so far as operation is concerned. There is no trouble more than with gasoline except a slight starting lag, measured in seconds, due to the necessity for letting the starting burner develop the necessary starting heat. The engine idles and accelerates just as well as with gasoline; there is no smoke or carbon accumulation, and the operator would never know he was using kerosene, and is more independent of cold weather than with gasoline as now used. With hand-cranking the burner gear may be rotated by the starting handle a few times before engaging the engine shaft; then pressing in the handle to pick up the engine, it will start promptly. It is desirable, although not necessary, that the burner be continued in operation a few minutes after the engine is started, and until the interior and exhaust connections warm up. This will prevent entirely the temporary accumulation of kerosene in the cylinder while it is cold and obviate completely smoke and lubrication interference. It is not absolutely necessary, as such accumulations are slight and disappear quickly as the engine operates, and in no case do they prevent its running.

With a self-starting gear the whole engine and burner can be started simultaneously, the first oil passing through without igniting and some, of course, accumulating until the burner tube heats up, which it does very quickly, and then the engine picks up and evaporates the oil accumulation. The whole time required and results are substantially the same as are now common with heavy gasoline in cold weather. Even this condition can, however, be eliminated entirely by a little electric fan motor on the burner gear, started by a button a moment before the main engine motor starting button is operated. With this arrangement no kerosene can accumulate, the engine should pick up instantly and the operator can keep the burner in operation as long as conditions warrant.

Author's Conclusion

It is hoped that by this presentation of principles on which good and satisfactory kerosene equipment can be designed, illustrated by one concrete example, the movement toward the production and use of kerosene automobiles will be undertaken immediately on a scale sufficiently large to affect the price of fuel within the next year. Commercial results can be obtained most quickly and with the least development and experimental expense, by the adoption of the sort of equipment described, but such adoption is not an absolute necessity. A

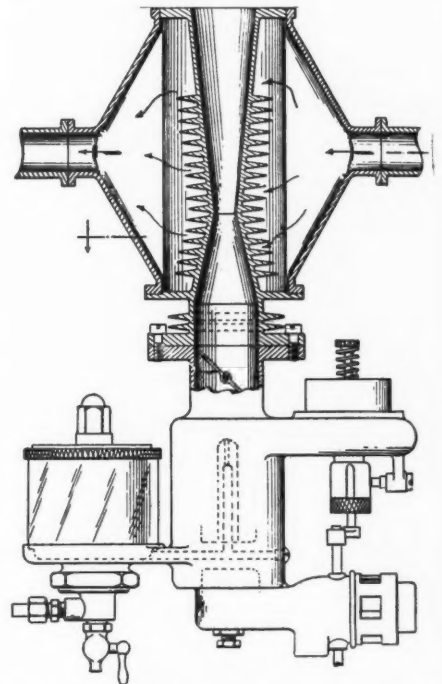
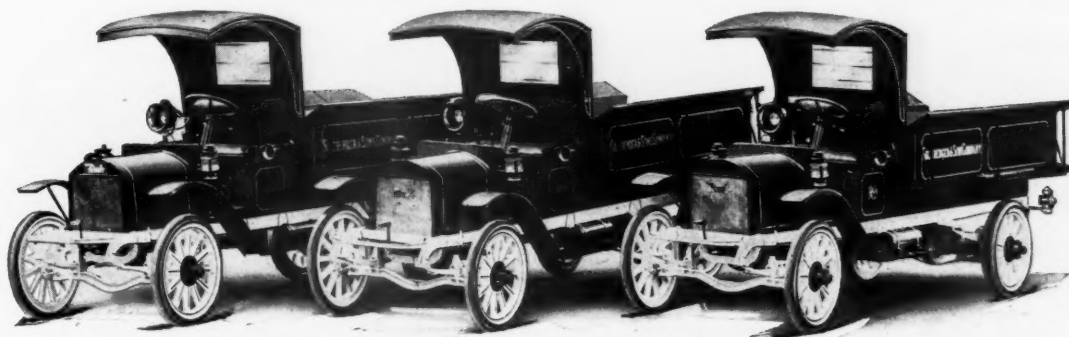


Fig. 17 Ribbed Type Short Good Venturi Vaporizer With Carburetor and Throttle

hundred different sorts of equipment could undoubtedly be designed all conforming to correct principles, but only with the expenditure of more experimental and development funds and with corresponding delay in time. Finally, it is equally possible to proceed along quite different lines from those laid down as the most desirable and immediately available, and still get good results. The public in general and the automobile and the oil industries must have something that will use kerosene and be so acceptable as to secure use and adoption on a big scale. In the long run it matters little just what principles are used in the equipment as long as it works right, but it is somewhat comforting to know at this time that something is immediately available for designers to adopt and use.



By Actual Test—50% Greater Mileage with Master Carbureter

Remarkable Test Made June 17th—Results in Master Carbureter Being Specified as Standard Equipment for Dart Trucks

The Master Carbureter is fast becoming standard equipment for the leading truck manufacturers of the country—solely on the strength of its remarkable economy, greater day in and day out dependability and its ability to deliver greatly increased power by actual road test.

Already twenty-three manufacturers of trucks have made tests and have substituted the Master for former equipment.

Entirely New Principle

The Master Carbureter is built on an entirely different principle from old-fashioned carbureters. There is a scientific and logical reason for the Master Carbureter increasing gasoline mileage 50% and more, besides giving greater power, dependability—and speed for those who want it.

The Master is a many-jet Carbureter. Instead of from one to three jets, the Master has as many as 21 jets. Through these jets, the Master feeds less gas than the old type Carbureter does through a single jet. But because the gasoline comes through in smaller sprays, it breaks up and mixes with the air very much more thoroughly. Thus the vaporization is instantaneous and complete—an impossibility with the old types.

One Jet at a Time

The fuel and air are proportioned mechanically by a rotary throttle. When the throttle is closed for idling or slow running, only one fuel hole is uncovered. As the throttle is opened, additional fuel holes are uncovered one by one and the fuel supply increased.

DART TRUCK RESULTS

The following test was made on a Dart Truck at the factory, Dart Motor Truck Company, Waterloo, Iowa, on June 17th, 1916, by officials of Dart Motor Truck Company:

1500 pound Dart Truck, $3\frac{1}{2} \times 5$ Buda Motor, loaded to capacity, carbureter installed, carefully adjusted. Power test was then made on a hill near factory after which tank and carbureter were drained preparatory to economy test. The mileage result showed 8.4 miles per gallon. Master Carbureter then installed. Power performance showed equal with mileage of 12.6 miles per gallon.

One-ton Dart Truck, $3\frac{3}{4} \times 5\frac{1}{2}$, Buda Motor, loaded to capacity with Carbureter installed showed average power with mileage of 10.4 miles per gallon. Master Carbureter then installed. Very perceptible increase in power shown with mileage of 15.2 miles per gallon.

1500 pound truck, power equal. Increase in mileage 4.2 per gallon, or 50 per cent increase.

1-ton truck. Very perceptible increase in power. Increase in mileage 4.8 miles per gallon, or 46.15 per cent increase.

Send for equally interesting figures showing tests made by other Truck Manufacturers now using Master Carbureters.

The Master Control

The Master Control is a device attached to the steering post, which enables the driver to rarify or enrich the mixture while running. This insures a perfect mixture for varying climates or topographical conditions—a great convenience. Without priming, the Master Control makes starting easy in the coldest weather and enables you to get maximum efficiency out of varying grades of fuel.

Trouble-Proof

The Master Carbureter frees the user from the greatest of carbureter trouble—it does away with all adjustments under the hood. Think what this means to motor truck users. Nothing to get out of order—nothing to tamper with. The Master is both fool and trouble-proof. This feature alone puts it in a class by itself.

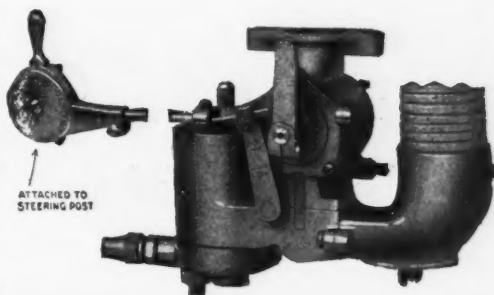
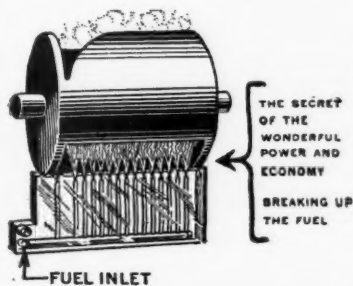
Book on Carburetion Sent Free

R. M. Anderson, chief engineer of the Master Carbureter Corporation, the greatest Carbureter authority, has written a remarkable little book on Carburetion, which we will gladly send free to those interested, as soon as it comes from the press. In it he not only explains the principle of carburetion, but shows why the Master is able to produce such revolutionary results. Merely write a letter or postal and we will reserve a copy of this little book for you and send it the moment it comes from the press. We suggest that you send today, however, as the edition is limited and the demand is bound to be large. Please address Dept. A.

Master Carbureter Corporation

Dept. 27 Detroit, Michigan

Pacific Coast Branch—922-24 So. Los Angeles St., Los Angeles, Cal.



DIFFERENTIAL SUBSTITUTES

By D. D. ORMSBY (Non-Member)
Abstract

Mr. Ormsby considers the conventional type of differential in a somewhat different light than it is usually regarded. According to his view, the conventional differential, rather than being inefficient is, on the other hand, too efficient in that it differentiates for all differences, whereas the automobile engineer only wants it to take care of the unequal velocity of the rear wheels.

Substitutes for the conventional type of differential are considered under four classifications; namely, the free-wheel type, the crank and eccentric types, the spiral gear type, and the solid axle. Examples of each of these classifications are described and the advantages and disadvantages of some of the more practical ones discussed.

In connection with the free-wheel types, the author explains that while these eliminate the inherent defect of the standard differential by differentiating when the wheels have unequal traction, yet with unequal size of tires the free-wheel types will drive more on a large tire because the wheel with smaller tire will have to rotate faster to make up for the distance traveled by the wheel having the larger tire. It is explained further that in making a turn all the power is applied to the inner wheel.

Mr. Ormsby believes that the spiral gear type will be the ultimate solution of the present differential problem.

Considerable space is devoted to a discussion of the elimination of any form of differential whatever. Although such construction has advantages of eliminating the spinning of the wheels and assuring positive travel under all conditions, Mr. Ormsby believes the disadvantages too great to be overcome. There must always occur, when the car is making a turn, a slippage of either the inner or outer wheel, or both, and from experiments conducted with a standard type of touring car and a well-known runabout, the author of the paper has come to the conclusion that the difference in travel of inner and outer wheels in making a turn at a given angle, depends on the gage and not upon the radius of the turn. Therefore, no matter how great the radius, the amount of slippage through a given angle is always the same; consequently, no matter how slight the diversion from a straight line, an extra load is always thrown upon the rear wheels, tires and axles where the solid axle construction is used. Another objectionable feature of the solid construction is the extra amount of power consumed in making short turns, on account of the necessity of slipping one or both wheels. Another condition which the solid axle does not take care of, is unequal size of tires. In a motor truck one tire is usually worn more than the other. To make up for the greater distance traveled by the larger wheel, the smaller wheel must slide the difference, or the larger must slip part of the time to compensate for the less distance traveled by the smaller one. This would occasion excessive wear on the new tire until both were brought to a uniform size.

Mr. Ormsby mentions some interesting experiments conducted by street railway engineers in connection with using differentials for street cars, to eliminate the corrugation of rails and wheels, as well as to economize in power consumption. It was indicated that with a street car equipped with a differentiating mechanism about one-half the power consumed by a car equipped with solid axles would be saved.

The author believes that the ultimate differential will be one which compensates freely for the difference in speeds of the rear wheels when the car diverges from a

straightened course, and is so constructed that it will be impossible for either wheel to spin when the other has lost traction.

AUTOMOBILE EXPERIENCES IN THE GREAT WAR

By W. F. BRADLEY (Non-Member)
Abstract

The author outlines the constructions that have shown up well under war conditions of operation, mentioning especially that four-cylinder engines carried under a hood were the most satisfactory. The internal combustion engine had found favor as compared with the gasoline-electric and steam-driven vehicles. The defects revealed by war service are given in considerable detail, the author finding that all of the trucks used had developed some weak point. Radiators and springs were given as a general source of trouble. The author believes more attention should be paid to the draining off of water from radiator, pump and jackets. The lubricating system for the engines should be of the pressure or circulating type so designed that the dirt will deposit away from the pumps. He outlines a number of operating troubles developed under the existing conditions of operation and gives examples of the way these have been remedied.

Considerable attention is paid to the methods of operating trucks away from made roads. The methods of fitting chains to the wheels, and the use of caterpillar attachments are described. All-metal wheels are being used in place of the wood wheels. Considerable tire trouble has developed; one reason being the tendency for the cambered roads to force one of the dual tires to carry the greater proportion of the load. Dimensions are given for bodies and a number of suggestions made as to their proper construction.

Although practically all the general transportation is done by rear-driven trucks the four-wheel-driven vehicle is used to a limited extent, mainly for operation off the main roads or on no roads at all. A description is given of tractors developed for this service. These are used mainly to draw batteries and heavy artillery. The importance of the armored car has been decreased mainly through the adoption of underground warfare. The author describes briefly the most suitable type of such a machine. One effect of the war has been to bring about the extensive use of trailers, the author stating that they are now being used behind all kinds of automobiles, both for the transportation of men working in the rear of the lines and for general haulage work around the depots.

In conclusion the paper considers the arguments found in the war zone in favor of

standardization. The author holds that such a tendency should be opposed as regards the general features of automobile design. Certain features that can be adopted without handicapping the design should, however, be insisted upon. He gives specifically the size and style of bodies, sizes of wheels and tires, magneto bases and couplings, carburetor flanges, towing hooks, turning radius, clearances, driving chains, and threads for all bolts and nuts as subjects for standardization. He also mentions the necessity for uniform nomenclature inasmuch as a great deal of confusion has been created by the difference in the names of American trucks, not to mention the trouble caused by the variation in English and French terms.

COLUMBUS, OHIO, DEALERS EXPERIENCE LITTLE TROUBLE WITH USED TRUCKS

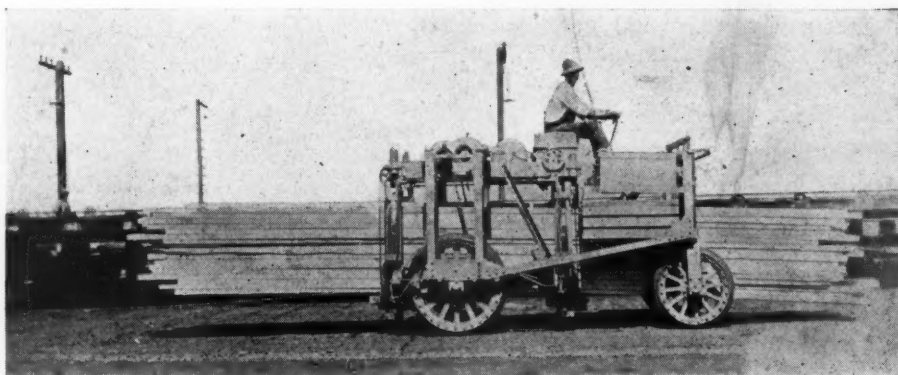
The used truck proposition in Columbus is not as big a problem as is the case in some cities, where trucks are used in larger numbers than in the Buckeye capital.

It has been the custom for dealers to take in second-hand trucks on about the same basis that has been in vogue in pleasure automobiles. In other words, a liberal allowance would be made for the second-hand truck in order to make the sale. When this was done it was found that the market for used trucks was so limited that the dealer could not sell them readily.

The money tied up in the used trucks was another burden to the dealer. But after some time the truck was usually sold at a figure where the loss was not as great that was at first anticipated.

These experiences were very valuable to the dealers and now only a small allowance is made on used trucks, excepting when the vehicle is in excellent shape and is of a kind that the prospects for disposing of it readily are good. Consequently few Columbus dealers are being "stuck" at this time on the used truck proposition.

In Cleveland the Cleveland Motor Co., agent for the Packard, has been compelled to erect a separate structure to handle the used truck proposition. The department takes care of both Packard trucks, which have been taken in through deals selling new Packard trucks, but also trucks of other makes, where a Packard truck has been sold.



Ross Electric Lumber Carrier

The above illustration shows the new Ross Electric Lumber Carrier, which has been recently developed by the Covel Manufacturing Company, of Benton Harbor, Mich.

"JIM" FLORIDA BACK FROM MEXICO

Without any "blare of trumpets" "Jim" Florida alighted in New York the other day, from Columbus, New Mexico, where he has been since the middle of April co-operating with the War Department in the organization of motor truck transportation.

When the first punitive expedition was sent into Old Mexico after Villa, it was apparent that motor trucks would be absolutely essential in keeping the advanced base furnished with forage and necessary supplies. Mechanics, machinists and drivers for the various truck manufacturers whose trucks were already at the border, became involved in all sorts of intrigue to make the best possible showing for the particular make of truck which they represented. In their zeal they frequently imposed great hardship upon the War Department, through their failure to co-operate with any rival manufacturer, or make of truck.

The War Department telegraphed the Locomobile Co. of America to send at once a practical man to take complete charge for the time being of the Motor Truck Transportation Department at Columbus, N. M., thus leaving the army of officers on the border free to devote their entire time to strictly military affairs. The Locomobile Co. had no hesitancy in sending James W. Florida, assistant manager of their Philadelphia Branch House, and one of the best known automobile men in the country. Mr. Florida will be remembered as one of the earliest successful racing drivers in America, having been one of the Locomobile team, with George Robertson, which won the Vanderbilt Cup for that car in 1908.

"The situation didn't look very pleasant at first," said Mr. Florida, "but it was all the more gratifying in view of how every one took hold to try and make an efficient and practical organization. It was perfectly natural that every truck driver or mechanic or manufacturer's representative should want the truck he was interested in to show up to the very best advantage. The difficulty at first was to get co-operation,

but when they stopped for a moment to think that they were working for the Government, and at a most serious time, at that, they soon took the right view of things.

"I told them all at the start that 'knocking' a competing truck would not be tolerated for one minute. We were all down there to help, not to hinder, and any truck that needed help, no matter whose make of truck it was or who drove it, would get all the attention and service it needed, regardless of fear or favor. Well, it wasn't long until most of the petty jealousies and personalities were all ironed out and good feeling was restored, and the service proportionately improved.

"We built a machine shop with concrete floors, that would take care of repairs on one hundred trucks at one time. We put in a store for 'spares,' parts, etc., that will compare favorably with any fine service station up North, here. No truck had to be held out of commission a minute, after we got our organization up to speed.

Mr. Florida's experience and untiring energy soon enabled him to establish a service which, perhaps, has not been equaled in the history of the motor industry. As evidence of his success in obtaining the complete co-operation of the different manufacturer's representatives, mechanics and drivers, he was tendered a dinner the night before he left Columbus, in appreciation of his work in helping to place the motor truck in the proper light before the United States War Department. At this dinner he was made the recipient of a beautiful gold watch, inscribed, "Presented to J. W. Florida, as a token of appreciation, by mechanics and helpers—United States Motor Transportation Department, Columbus, New Mexico, June 15th, 1916."

Captain Lee, of the United States Army, succeeds Mr. Florida as Superintendent of the Transportation Department at Columbus.

WHY NOT A MOTOR TRUCK PARADE?

By GEORGE W. GRUPP

A motor truck parade would not be a bad stunt for a group of dealers to pull off in their respective cities. It would advertise the truck in great style. It would get people to think in the motor sense, and forget thinking in the horse sense. It would increase the motor truck sales, and make the truck shows look like a back number.

But how should the dealers stage a parade? Should it be just an ordinary parade of empty motor trucks driving through the streets? No! That would be a waste of time and money, as anyone can see an empty motor truck driving through the streets without spending a dime to see them parade. Should they decorate up with flowers and flags and pretty floats of all kinds? No! That would also be a waste of effort. But this is what the parade should consist of. All the dealers should get together and pick out such names from their list of buyers so that all the various businesses in which the truck is engaged in will be represented. Thus the spectator could see the multitude of businesses the truck is being used in with success. And to get the user's co-operation and to make the parade more worth while, the dealers should request him to load his truck with the particular article or articles which he makes or to whatever service he puts his truck. And to make it as alive as possible, the users should be requested to show how they make their wares. For example, a bakery truck could have a few bakers on the truck who are busy making a particular kind of bread or cake. The dealer should impress on the mind of the user the great benefits he will receive from such an opportunity to advertise his goods. Incidentally, the truck business is getting a great big boost.

A truck parade such as the writer has in mind would set the whole town a talking about motor trucks. The housewife would tell her grocer that he ought to buy a truck like Mr. So and So has. The business man would tell Mr. Manufacturer that if he would buy a truck he could make prompt deliveries just as Smith & Co. is in the habit of doing. All of this would set the business men thinking about motor trucks. And that is just what the dealers want, so why not get busy?

Some dealers will object to a parade. That is to be expected. And the objectors, it will be found, are those who have but a few trucks in operation in their respective city. For their comfort, and to win over their enthusiasm and confidence, the other dealers should compromise. Why not limit the number of trucks? Only allow a single truck to represent a particular business. Thus the stronger brother could give way to the weaker one and give him an equal opportunity.

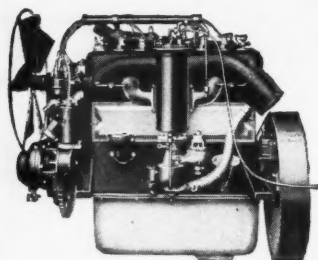
All of the foregoing demonstrate that with the proper spirit of co-operation, both on the part of dealers and the users, a parade of this kind should be a profitable investment of time and money for both user and dealer.



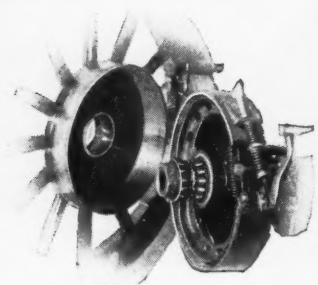
Riker Truck Carrying Supplies From United States Military Base, Columbus, N. M., to General Pershing's Army at Namiquipa
Mr. Florida is the second figure, directly under the cross

STUDEBAKER

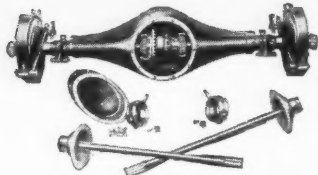
Commercial Cars



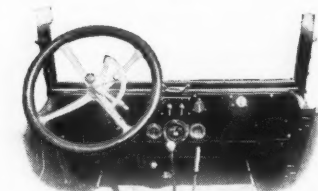
The simple, **POWERFUL**, yet economical Studebaker motor—develops as much power as the usual ton or two-ton utility truck.



Big, ample-size Studebaker brakes.



The famous Studebaker **FULL**-floating rear axle.



Showing the extreme simplicity of the Studebaker controls—all are conveniently located on the dash within easy reach and in unobstructed view of the driver.

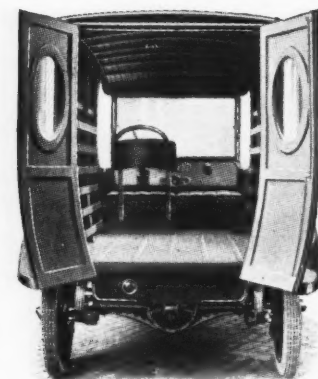


HALF-TON CARS

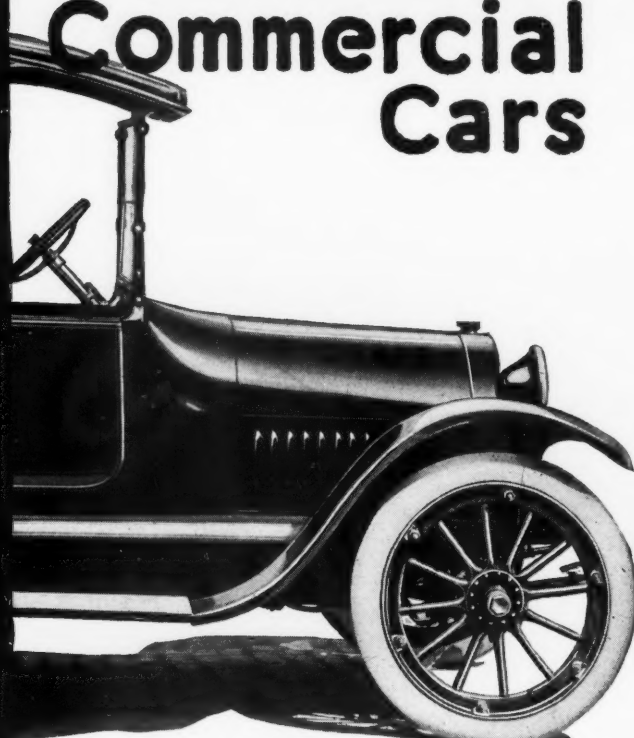
Panel Delivery Car	- - -	\$875
Express Car	- - -	850
Station Wagon	- - -	875

ONE-TON CARS

Open Express	- - -	\$1200
Stake Body	- - -	1250
Bus, 16-passenger	- - -	1400
F.O.B. Detroit		



Showing the roominess and loading space in the car—one of the results of Studebaker's long experience in producing high-grade delivery vehicles.



Can You Wonder at a Studebaker Dealer's Success?

Aside from the wonderful market that a Studebaker Dealer has to work in—and aside from the **COMPLETE** line of cars that he has to sell—can you wonder at his success when you consider the **VALUES** that he has to offer in **EACH** of the six cars in the Studebaker Line?

Take this Panel Car at \$875 for one example. Here are illustrated a few of the Studebaker Superiorities. What other car gives such **VALUE** at the price?

It is the only commercial car at its price with fore doors, electric starter and electric lights—the only car at its price that combines dome light, gas indicator, oil gauge, leather upholstery, touring car finish, crown fenders and heavily braced frame.

And when you remember that the car itself is the outcome of sixty-four years' success in building delivery vehicles of every nature, and of the experience of producing more than 245,000 pleasure cars, can you wonder that such a car is easy to sell? Write at once for full information on cars and open territory.

STUDEBAKER

South Bend, Ind. Detroit, Mich. Walkerville, Ont.
Address all correspondence to Detroit

When Writing, Please Say—"Saw Your Ad. in the CCJ"